Vol. 10. No. 7

WEED ABSTRACTS

COMMONWEALTH INSTITUTE
OF ENTOMOLOGY
LIBRARY
- 6 JUL 1978

July 1961

NOTES FOR READERS

Weed Abstracts endeavours to provide a comprehensive coverage of the world's literature on weeds, weed control and closely allied subjects. To this end, over 370 journals and nearly 100 annual reports are regularly searched. Other journals, reports, bulletins, etc. are abstracted as they are seen. Additional coverage is obtained through agreements with other abstracting organizations.

Editor: P.J. Boyle

Abstractors: D.M.L. Sparrow, M.G. Grace, J.W. Frampton, J.L. Mayall

Correspondence about subscriptions to Weed Abstracts should be addressed to: The Treasurer, British Weed Control Council, c/o National Association of Corn and Agricultural Merchants, Cereal House, 58, Mark Lane, London, E.C.3. Other correspondence should be addressed to: Information Section, A.R.C. Weed Research Organization, Department of Agriculture, Parks Road, Oxford.

As far as possible the journal abbreviations used are those given in the World List of Scientific Periodicals. Holding library symbols are also taken from the World List, e.g. O.BO = Botany Department, Oxford. Numbers at the end of abstracts, e.g. 75(492) are for internal use only.

When a paper is by more than one author, the address of the first author only is given.

Where an abstract is taken from an abstracting journal the acknowledgement follows the abstract, e.g. Herb.Abstr. 2:163. Where it is quoted only in part the acknowledgement is preceded by the word "from", e.g. From Biol.Abstr. 2:294.

The Information Section is always pleased to receive comments and suggestions for the improvement of Weed Abstracts.

* An asterisk before the author's name indicates that only the title of the paper has been seen.

Continued from the inside back cover

ac	- acre(s)	in.	- inch(es)	p.s.i.	- pounds per square in.
a.e.	- acid equivalent	kg	- kilogram(s)	v/v	- volume/volume
a.i.	- active ingredient	l	- litre(s)	w/v	- weight/volume
cm	- centimetre(s)	lb	- pound(s)	w/w	- weight/weight
d.b.h.	- diameter at breast height	m	- metre(s)	>	- greater than
ft	- foot(feet)	ml	- millilitre(s)	<	- less than
g	- gram(s)	oz	- ounce(s)	#	- pounds per acre
gal	- gallon(s)	post-em.	- post-emergence	±	- with or without
ha	- hectare(s)	pre-em.	- pre-emergence		
		p.p.m.	- parts per million		

Language abbreviations: an initial capital denotes the language of the article, a small letter that of the summary: - Dan. - Danish, Du. - Dutch, E. - English, F. - French, G. - German, It. - Italian, Jap. - Japanese, Nor. - Norwegian, Russ. - Russian, Span. - Spanish, Sw. - Swedish.

1178. BONDARENKO, D.D. and STROUBE, E.W. (Ohio State Univ.,Columbus,U.S.A.). Herbicides to control weeds in field crops. Leafl.Ohio State Univ.agric.Ext.Ser., 1961, L-75,pp.10, tabs.1.
The following recommendations have been added to the 1960 list: atrazine 2 # in maize from emergence to 3-leaf stage; (for trial only) atrazine 4 # for control of quackgrass [Digitaria sanguinalis] from September to mid-October; in soybeans, amiben 2 # + chlorpropham 2 # pre-em.; in sugar beets, endothal 3 # + TCA 5 # post-em. - D.M.L.S. [54(77.1)]

1179. UBRIZSY, G. and CSONGRADY, M. Chemical weed control with chloro-amino-triazine. Acta agron.Acad.Sci.hung., 1960, 10,197-227.
Weeds in maize may be controlled by pre-em. application of simazine or atrazine at 9-10 kg/ha. Two crops of maize in succession may be grown if weeds are thus controlled. Abstr.J.Sci.Fd. Agric.12:i-282.

1180. * KLIUEVA, M.P. and LEVIN YA.I. The economic effectiveness of the use of herbicides in corn-growing. Kukuruza, 1960, (6),33-35,(Russ.).

1181. STAZIONE CHIMICO-AGRARIA SPERIMENTALE DI TORINO. Studio sull' efficacia del diserbante Iso-cornox. [Study on the efficiency of the herbicide Iso-cornox.] Annu.Staz.chim.-agr.Torino 1958-60, 20,pp.393.
P.321. Iso-cornox (potassium salt of mecoprop 32%) at 1 l/1800 m^2 applied at the beginning of April to wheat in the boot stage gave excellent control of Ranunculus spp., Rumex spp. and Carduus spp., was a little less effective against Stellaria [media] and Veronica sp., and ineffective against Convolvulus sp. and Lithospermum arvense. - D.M.L.S. [74(45)]

1182. RUSS, O.G. and ANDERSON, L.E. (Agric.Exp.Sta.,State Univ.,Manhattan, Kansas,U.S.A.). Field bindweed control by combinations of cropping, cultivation and 2,4-D. Weeds, 1960, 8,(3),397-401. tabs.1,bibl.3.
Various combinations of cropping (with continuous wheat, spring oats, or forage sorghum), cultivation (2-8 times annually), and 2,4-D (applied once or twice annually), were evaluated over a 6-year period for control of Convolvulus arvensis, and compared with intensive cultivation (5-8 times annually) ± 2,4-D (once annually) over a 3-year period. The 3-year system of intensive cultivation in combination with 1 annual 2,4-D application gave the best control. Continuous lister-cultivated forage sorghum + cultivation and 2,4-D over a 6-year period was slightly superior to a similar combination with wheat as the main crop. Crop yields were reduced by all systems tried and no single method was acceptable in all conditions. - D.M.L.S. [O.W.]

1183. TARR, S.A.J. (Bot.Dep.,Exeter Univ., England). Witchweed (Striga hermonthica) on rain-grown pearl millet in nitrogen-deficient sandy soil of the central Sudan. Ann.appl. Biol., 1961, 49,347-9, tabs.1.
Spraying with 2,4-D (sodium, 80%) at 1 # 2 weeks after sowing (after thinning) reduced and delayed S. hermonthica attack, but resulted in increased yields of pearl millet (Pennisetum typhoideum) only where no ammonium sulphate had been used, under the conditions of soil nitrogen-deficiency of these trials. Yields, however, from unfertilized plots were very low and spraying was not economic. Millet plants showed varying degrees of plant injury, damage being most severe in unfertilized plots. - D.M.L.S. [O.W.]

1184. SMITH, R.J. (Dep.Agric.,Stuttgart, Arkansas,U.S.A.). 3,4-dichloropropionanilide for control of barnyard grass in rice. Weeds, 1961, 9,(2),318-22, figs.1,tabs.3,bibl.4.
See Weed Abstr. 9:1392. [O.W.]

1185. de VILMORIN, R. Presentation d'ouvrage: Les plantes adventices des rizieres de Camargue, par M. Gabriel Tallon. [Presentation of a work: Weeds in the rice-fields of Camargue, by M. Gabriel Tallon.] C.R.Acad.Agric.France, 1961, 48,(8),456-8,(F.).
A short account of a 1960 paper in which the author, M. Tallon, compared the present weed situation in Camargue ricefields with that 10 years ago. He noted the advantages (but also the high cost) of transplanting rice as compared with direct sowing, the appearance of 4 weed species (not stated) new to the Camargue (1 of them common in Spanish rice-fields), and the establishment of a Najas sp. in submerged ricefields. - D.M.L.S. [O.W.]

1186. FLEETWOOD, J.R. (Univ. of Missouri, Columbia, U.S.A.). Row spacing and weed control in soybeans. Soybean Digest, 1960, 20,(12),6-7.

A report is given on the 1960 session of the National Soybean Crop Improvement Council before the American Soybean Association convention in Memphis. One of the author's conclusions was that, where weeds can be controlled, a yield increase of ca. 10-15% (probably higher in the north and lower in the south) will be obtained from closer row spacing with near normal plant spacing. Since chemicals to date are expensive and unsatisfactory, cultivation will be necessary to control weeds. - D.M.L.S. [22(77.8)]

1187. * KAWATEI, K., KITANO, S. and SHIRASAWA, Y. (Tokyo Univ.). Studies on establishment of a weeding system in field cultivation. I. Influence of weeds on the yield of potato of non-hilling culture. Proc.Crop Sci.Soc.Japan, 1958, 27,(2),252-4, (Jap.e.). [C.A.]

1188. PATITZ, E. (Inst.für Technologie der Fasern,Dresden,East Germany). Krankhafte Veränderung des Flachses bei unsachgemässer Anwendung eines Herbicides. [Pathological alteration of flax upon inappropriate herbicide application.] Faserforsch u.Textiltech., 1960, 11,495-500, (G.russ.e.), figs.14,bibl.7.

The results are given of studies of morphological and anatomic deformities caused to fibre flax by post-em. spraying with 0.2% MCPA solution when the plants were > 22 cm high and had reached the stem-extension growth stage. The major effects caused were twisting and discoloration of stems, stem brittleness and a reduction in technical fibre length. Anatomical abnormalities caused to the stems are shown in some detail. Bast cells showed deformities. The cortical parenchyma cells had a high lignin content and the fibre breaking strength and yield was low in treated plants. P.J.B. [T.P.I.]

1189. MILLER, J.H., KEMPEN, H.M., WILKERSON, J.A. and FOY, C.L. (Crops Res. Div.,A.R.S.,U.S.Dep.Agric.). Control of barnyard grass (Echinochloa crusgalli) in western irrigated cotton. Weeds, 1961, 9, (2),273-81, tabs.5,bibl.10.

In trials over 4 years, monuron and diuron at 1 and 1.5 # and chlorpropham and CDAA at 6 and 9 # were applied pre-em. over the row and as directed broadcast sprays at early and normal lay-by. In 2 out of 4 years pre-em. treatments were not irrigated until 60 days after application. Lay-by treatments were irrigated as soon as possible after application and, except for irrigation, not disturbed until harvest. The pre-em. results were variable and showed that pre-em. application in furrow-irrigated cotton depends for success on favourable water relationships, which are seldom achieved in practice. Other application methods are therefore necessary. Preliminary investigations in California have shown that incorporation of certain herbicides in moist soil during sowing may ensure weed control in the absence of rainfall.

At early lay-by, monuron and diuron gave the best weed control and at normal lay-by, monuron, diuron and NPA. Weed control was unsatisfactory unless the entire surface of the beds was wetted when irrigated. Yield was not affected by any of the lay-by treatments. Quality of lint was often improved by the early lay-by treatments, but not by the normal lay-by which was applied when weed growth was less heavy. Only monuron and diuron left sufficient residue to be toxic to winter-sown barley. D.M.L.S. [O.W.]

1190. BONDORFF, K. (Statens Planteavls-laboratorium, Lyngby,Denmark). Kemiens betydelse som vägledning för produktionen inom jordbruket. [The importance of chemistry for agricultural production.] K.Skogs LantbrAkad.Tidskr., 1961, 100, (1-2),125-43.

A brief allusion is made to the contribution of herbicides to increased agricultural production. It was calculated from the results of some 200 trials in spring cereals in Denmark that the use of herbicides resulted in a mean yield increase of more than 200 kg grain/ha. - P.J.B. [O.W.]

1191. BOOTS PURE DRUG CO. LTD. Grassland weed control at Thurgarton. Boots Bookl., (n.d.), pp.11.

Recommends Cornox G (mixture of 2,4-D and MCPA) at 3 pint/ac in 20 gal water applied 5-14 days after removal of livestock, which should be excluded for a further 10-14 days. Hard grazing before removal of livestock and again after their return is advised, also basic slag application the previous winter and, where fertility is low, N, P and K. - D.M.L.S. [O.W.]

1192. DELAHUNTY, E. (Dep.Agric., Ashburton,New Zealand). Nodding thistle control in pastures with chemicals. N.Z. J.Agric., 1961, 103,(1),23-5,(illus.).

In trials over 3 years, good control of Carduus nutans was obtained with applications of MCPA (potassium) or 2,4-D (amine) at 1 # in April to May or in September, or of MCPB (sodium) in April to May only. April to May treatments at 0.5 # were only slightly less effective. MCPA (potassium) was effective at all times except June and November. In 1 year, only 2,4-DB 0.75 # was effective in all but the midwinter months. Spraying should be done before the large-rosette stage is reached. - D.M.L.S. [O.W.]

1193. GOULDING, P.F. (Dep.Agric., Hamilton,New Zealand). Eradicating Kikuyu grass by spraying. N.Z.J.Agric., 1961, 103,(1),65-7,(illus.), tabs.1.
Excellent control of Pennisetum clandestinum was obtained by applying dalapon at 10 # during the period summer to early autumn, with a further 10 # applied 8-10 weeks later. The plots were disc harrowed and raked 4-5 weeks later, and a 1:1 mixture of Italian and short-rotation ryegrass at 30 # sown and a top dressing of superphosphate 2 cwt/ac added. Stock were kept off the area until the spring. In preliminary trials TCA, sodium chlorate and amitrole were less effective than dalapon, and summer was the best season for the first dalapon application. - D.M.L.S. [O.W.]

1194. CAMPBELL, M.H. (Bathurst Expt. Farm,Bathurst,New South Wales). Serrated tussock control. A review of the efficiency of chemicals in killing serrated tussock (Nassella trichotoma (Nees) Hack). Agric.Gaz.N.S.W., 1961, 72,(3),116-130,(illus.), tabs.6,bibl.14.
A review, with recommendations for the use of TCA and dalapon. - M.G.G. [O.W.]

1195. BOVEY, R.W., le TOURNEAU, D. and ERICKSON, L.C. (Agric.Exp.Sta.,Moscow, Idaho,U.S.A.). The chemical composition of medusa head and downy brome. Weeds, 1961, 9,(2),307-11, tabs.3,bibl.7.
When compared with those of downy brome and many desirable grass species, the moisture, crude protein, crude fat, crude fibre and lignin contents of Elymus caput-medusae were about the same, but the ash content was much greater. The silica content of the ash amounted to >10% of the plant's dry weight. This high silica content accounts for its harshness and may explain its unpalatability to stock and also its slowness in decomposing in the field. Nitrogen fertilization to some extent, increased its utilization by cattle and horses. E. caput-medusae silage, whether pure or with additives, was unacceptable to sheep. Authors' summary modified. [O.W.]

1196. TSCHIRLEY, F.H. and MARTIN, S.C. (Agrizona Agric.Exp.Sta.,Tucson,U.S.A.). Burroweed on southern Arizona range lands. Tech.Bull.Agric.Exp.Sta.,Arizona Univ., 1961, 146,pp.34, figs.10,tabs.9,bibl.39.
The distribution and toxicity to livestock of burroweed (Haplopappus tenuisectus) is briefly reviewed, together with the results of studies on its control and its effect on range vegetation in S.W. Arizona. Cessation of range fires, continuous grazing and heavy rainfall in some years, enabled burroweed to become widespread. Control measures applied in early summer, when food reserves were at or near minimum, were most effective. Biological control by two beetle species of the genus Crossidius, grubbing and mowing were unsatisfactory. The most effective herbicidal treatment was 2,4-D low-volatile ester at 1 lb in a 1:4 diesel oil:water emulsion, applied at 5 gal/ac between 1 March and 1 May when the leaves were still succulent. The time the leaves hardened varied considerably from year to year and the results obtained with 2,4-D were erratic. 2,4-D as 0.1 to 0.2% aqueous solutions was effective only on small plots. Burning was most effective in May or June, before grass growth started, and gave 90% kill. Its success depended on the grazing practices before and after burning. Perennial grasses previously protected by the weed decreased, unless the area was protected from heavy grazing. - M.G.G. [23(79.1)]

1197. NELSON, D.W. and STOKES, V.N. (For. Ser.,Region 1,Missoula,Montana,U.S.A.). Using helicopter to chemically control big sagebrush and wyethia on the Beaverhead National Forest 1959. Methods and preliminary results. Rep.U.S.Dep.Agric.For.Ser. 1960, (revised 1961),pp.22,(illus.), tabs.4.
A full report, with details of equipment, organization, and costs, of the spraying by helicopter of 10 770 ac using 2,4-D 1, 1.33 and 2 lb, each in 2 gal diesel oil at ca. 2.8 gal of mixture/ac.. Spraying was done when Artemisia tridentata was growing vigorously and Wyethia amplexicaulis was in the early bloom stage. The best results on test plots, 88% kill of A. tridentata, were, unaccountably, obtained with the weakest concentration used. Overall preliminary results showed

almost complete kill of A. tridentata, but rather erratic kill of W. amplexicaulis. Improvement in range quality was indicated by abundant grass seedlings, improved vigour, and decrease of undesirable species. D.M.L.S. [17(78.6)]

1198. PETERS, E.J. and DAVIS, F.S. (U.S. Dep.Agric.,Columbia,Missouri,U.S.A.). Control of weeds in legume seedings with 4-(2,4-DB), dalapon and TCA. Weeds, 1960, 8,(3),349-67, tabs.16,bibl.17.

Detailed results are given of 2 two-year trials. In trial 1, the amine and ester of 2,4-DB were compared at 0.5-2 # alone and also at 1 # mixed with dalapon 2 #, applied for 2 years in succession to lucerne 6-10 in. high, birdsfoot trefoil 3-4 in. high and red clover 4-5 in. high. In trial 2, TCA 8 # and dalapon 2 and 3 # were applied 2 years in succession alone and with 2,4-DB 1 and 2 #, with or without a later treatment with dalapon 2 # after the first cutting, to lucerne 6-10 in. high and birdsfoot trefoil 3-5 in. high.

The main weeds early in the season were Polygonum sp. and Amaranthus sp. and, later, Digitaria spp. and Echinochloa crusgalli.

Lucerne. In trial 1 the highest yield of lucerne over the 2 years was given by 2,4-DB (amine) at 1 #; the ester at 0.5 # gave good weed control but a lower yield. The mixtures with dalapon reduced the yield. The amine at 0.5 gave poor weed control and low yield. In trial 2, TCA appeared to be more toxic to lucerne than dalapon; both of them (± 2,4-DB) reduced the yield of the 1st cut but not appreciably that of the 2nd, compared with 2,4-DB alone. Yields were reduced more by dalapon 3 # than 2 #. In 1958 when abundant rainfall allowed a 3rd cut in September, the yield of the 3rd cut was reduced by the supplemental dalapon treatment after the 1st cut.

Birdsfoot trefoil. In trial 1 the highest yields of birdsfoot trefoil resulted from the mixtures with dalapon. There was no significant difference, in effect, between the amine and ester of 2,4-DB; yield was lower from 2 # than from 1 # of the ester. Broad-leaved weed control was less effective than in lucerne. In trial 2 a significantly higher yield plant population was obtained in 1957 from dalapon 2 or 3 # than from TCA, this was due to better grass control. In 1958 dalapon, TCA and 2,4-DB all gave significantly higher yields and populations than the control. The sub-treatments with dalapon applied late in addition to 2,4-DB did not improve the stand.

Red clover. (Trial 1 only). Dalapon treatments caused serious yield reductions. Yields were not reduced by 2,4-DB even at 2 #, but low yield resulted from the amine at 0.5 # because of poor weed control. In general, good overall weed control was obtained throughout with the mixtures of 2,4-DB + dalapon or TCA. - D.M.L.S. [O.W.]

1199. SEN, K.M. Studies on the influence of some auxin herbicides on grass-seed crops. Meded.Inst.Biol.Scheik.Onderz. LandbGewas.,Wageningen, 1960, 106,pp.70, (E.du.), figs.13,tabs.32,bibl.64.

In trials in the Netherlands during 1957-9, field and pot trials were carried out with Poa trivialis, P. pratensis, Festuca pratensis, F. rubra and Lolium perenne in which these species were treated with 2,4-D amine, MCPA K salt and 2,4,5-TP low-volatile ester, applied at rates of 1-2 kg/ha in 1250 l spray. In additional trials, 2,4-D was applied to Lolium multiflorum var. westerwoldicum and Poa annua, grown under controlled conditions. The morphology of the growing point was used as a criterion of stage of growth at the time of treatment, and this is discussed, with illustrations. The limitation of this criterion in not indicating the point at which the growing point passes from the vegetative to reproductive stage is indicated. A review is given of morphological abnormalities commonly observed in Gramineae after treatment with auxin-type herbicides.

The grasses showed the greatest incidence of stem and leaf abnormalities following treatment with 2,4-D and MCPA where these were applied when the growing point was in the vegetative stage; 2,4,5-TP applied at the same growth stage caused no such abnormalities. Tillers treated at the same stage of vegetative primordial growth, but at different times of the year, did not necessarily react in the same way. Of the species tested, Poa pratensis was the least and Poa trivialis the most susceptible to the herbicides in terms of leaf and stem abnormalities, while the Festuca species were intermediate in reaction. Poa trivialis was notable in that the highest % of abnormalities were caused by treatment after winter, while the other species showed the highest % when treated before winter.

The stage of growth at which the highest % of leaf and stem abnormalities were caused was, in all cases, the same as that at which the highest % of inflorescence abnormalities resulted. Many inflorescence abnormalities, however, were caused

by damage to the inflorescence caused by traversing already malformed leaves of the shoot. Certain structural abnormalities, such as irregularly alternating spikelets or bunches of spikelets, were caused by sprays applied before any initiation of the reproductive phase of development could be observed. The highest susceptibility in terms of inflorescence abnormalities was noted in Lolium perenne and Poa trivialis (Lolium perenne was not included in the studies on leaf and stem abnormalities, though it was considered likely to behave similarly to Poa trivialis in that respect), while Festuca rubra and Poa pratensis were the least susceptible. The degree of susceptibility appeared to be correlated with earliness of flower initiation and tillering intensity under cold conditions. It was suggested that the more time there was available between the respective times at which its cold and its day-length requirements were fulfilled, the more susceptible a given species would be to auxin-type herbicides. Except in the case of 2,4,5-TP, treatments which caused the greatest degree of stem, leaf and inflorescence abnormalities did not necessarily result in the greatest reduction in seed yields. It was concluded that with the species mentioned here, applications of the herbicides used in these trials, made after the plants have reached a stage at which 3-4 tillers are present in autumn, will have little or no effect on seed yields, with 2,4,5-TP, no yield reduction is to be anticipated from any treatment in autumn with normal rates used in practice (0.6-1 kg/ha). - P.J.B. [207(492)]

HORTICULTURAL, ORNAMENTAL AND PLANTATION CROPS

1200. AMERICAN VEGETABLE GROWER. Weed control guide. Amer.Veg.Grower, 1961, 9, (7),50-1, tabs.1.
Current recommendations are given for chemical weed control in vegetable crops, based on data from the U.S. Department of Agriculture. - H.A.R. [N.V.R.S.]

1201. ALBAN, E.K. (Ohio Agric.Exp.Sta., Columbus,U.S.A.). Chemical weeding of vegetable crops 1961. 46th Annu.Proc.Ohio Veg.and Potato Growers Assoc., 1961, 98-107, tabs.2.
Suggested chemical weed control practices for use in Ohio in 1961 are tabulated. Notes include the information that EPTC gave excellent results in potatoes in 1959 and 1960 when incorporated after application at 4 # pre-planting, pre-em. or directed post-em., and that CDEC has given variable weed control when used in a range of crops over a period of 4 years. For best results with CDEC adequate soil moisture after application and temperatures below 80°F are required. - H.A.R. [N.V.R.S.]

1202. HOPEN, H.J. and RIES, S.K. (Dept. Horticulture,Mich.State Univ.,East Lansing, U.S.A.). The evaluation of several herbicides applied to tomatoes at different times and locations. Quart.Bull.Mich.State Univ., 1961, 43,(3),581-7, tabs.3,bibl.17.
N-(3-chloro-4-methylphenyl)-2-methylpentanamide (Solan) 2 # gave good weed control with no injury when applied pre-em. to both direct-sown and transplanted tomatoes. Granular amiben 2 # and granular CDAA 4 # gave commercially acceptable weed control and no injury to tomatoes; granular amiben 4 # caused no visible injury when tested on 26 tomato varieties. Pre-em. applications to transplanted tomatoes of granular EPTC, O-(2,4-dichlorophenyl)-O-methyl isopropyl-phosphoroamidothioate (Zytron) 10 #, emulsifiable amiben 2 #, simazine 1 # and granular CDAA 8 # caused injury and CDEC, neburon, EPTC and dimethyl-2,3,5,6-tetrachloroterephthalate (Dacthal) gave unsatisfactory weed control.
Irrigation following the application of granular CDAA 8 # and granular EPTC 6 # did not improve weed control, but it increased the effectiveness of Solan, granular amiben, granular CDAA 4 #, granular simazine and emulsifiable EPTC. Injury from granular EPTC 6 # was more apparent when applied in conjunction with irrigation, but irrigation did not increase injury resulting from any other treatment.
The main weeds present were Chenopodium album, Ambrosia artemisiifolia, Digitaria sanguinalis, Echinochloa crusgalli, Amaranthus retroflexus, Portulaca oleracea, and Eragrostis cilianensis. - J.W.F. [O.RE.]

1203. BING, A. (Ornamentals Lab.,Farmingdale,Long Island,New York,U.S.A.). Controlling weeds in pansies. Bull.N.Y.State Flower Grs, 1960, 176,1-2, figs.2.
Granular EPTC 3-6 # applied pre-planting in autumn, followed by light cultivation, and granular neburon 4-6 # (not raked in) gave good weed control and were not harmful to the pansies. Simazine and diuron were very

injurious. Details of pre-sowing treatment by steam, methyl bromide gas and SMDC are given. - M.G.G. [135(74.7)]

1204. KATES, A. Lawn weed control. Circ. Va.polytech.Inst., 1960, 820, pp.4.
Gives recommendations for control of crabgrass [Digitaria sanguinalis] goosegrass [Eleusine indica], wild onion and garlic [Allium vineale] and other broad leaved weeds in lawns. - D.M.L.S. [14(75.5)]

1205. SCHERY, R.W. (Lawn Inst.,Marysville, Ohio,U.S.A.). Weeding lawns. Gdn.J.,N.Y. bot.Gdn., 1960, 10,95-7.
A brief review of the various herbicides in use for controlling crabgrass (Digitaria sanguinalis] and other lawn weeds. - D.M.L.S. [52(77.1)]

1206. AMERICAN CHEMICAL PAINT CO. Have a weed free lawn. Bookl.Amchem.Prod.Inc., 1960, pp.23.
Recommendations are given for the control of weeds in lawns with various herbicidal products. These include "Weedone lawn weed killer" for Hydrocotyle rotundifolia, "Weedone clover killer" for Desmodium canum and KCNO for Eleusine indica. - M.G.G. [474(42)]

1207. * FOSTER, L.R. Grass and weed control with herbicides in apple and pear orchards. Oreg.State Hort.Soc.Annu.Rpt, 1959, 51,31,33.

1208. IMAMALIEV, A. Defoliation of fruit seedlings. Sadovodstvo 1960, (9),23-4,(Russ.).
Use of magnesium chlorate and endothal for defoliating apple seedlings. - J.W.F.

1209. DOLL, C.C. (Agric.Experiment Station,Ames,Iowa,U.S.A.). Chemical weed control in young grapes. Weeds, 1960, 8, (3),368-73, tabs.4,bibl.4.
Herbicides were applied as direct sprays (except chlorpropham in 1 year when it was broadcast as a dust) to grapes var. Concord 1 and 2 years after planting (when dormant) and to var. Fredonia 1 or 2 days after planting (when buds were swollen) and again 1 year later. Diuron 1.6-4.8 # (in 1 year only) and simazine 1-4 # (in both years) caused leaf chlorosis which was more serious and more persistent from the higher rates. Both herbicides gave effective season-long weed control though simazine 1 and 2 # was less effective than 3 and 4 #. Diuron 3.2 and 4.8 gave residual control which lasted through mid-season of the 2nd year. The principal weeds were Setaria lutescens, Kochia scoparia and various annuals. Chlorpropham 8 # controlled weeds for 12 weeks only and caused some stunting of Fredonia vines (possibly due to contact with swollen buds). Amitrole 0.5 and 1 # alone gave poor weed control and when mixed with diuron 1.6 # did not enhance the effect. Shoot growth was not significantly reduced by any herbicide. No differences in varietal reaction were noted. - D.M.L.S. [O.W.]

1210. WELLMAN, F.L. (Coffee Agric.Exp. Sta.,Rio Piedras,Puerto Rico). Coffee. Leonard Hill Ltd.,London, 1961, pp.488, 70/-.
Includes a chapter on tillage, weeds, and mulch, in which the author reviews the harmful effects of weeds, the effect of clean weeding on erosion and coffee production, the effects of weed cover and mulches, and selective weeding. Chemical weed control is only briefly discussed, but a list of herbicides for use in coffee plantations is included.- D.M.L.S. [O.RE.]

BIOLOGY OF WEEDS AND POISONING BY WEEDS

1211. * KULPA, W. [The influence of weed infestation on the yield of some crops.] Lublin.u.Marie Curie-Sklodowskiej Ann.Sect.E., 1959, 12,(9),301-18.

1212. * MAMEDOV, S.F. [Investigation of linear dimensions of some principal and prospective wheat varieties and their accompanying weeds in Azerbaijan SSR.] Akad.Nauk.Azerb.SSR.Inst.Zeml.Trudy 1958, 4,27-44,(Russ.).

1213. * SWIETOCHOWSKI, B. [The problem of sowing weeds and their control in the light of biological and agricultural science.] Wroclaw.Wyzsza Szkola Roln. Zeszyty Nauk.Roln., 1958, 4,23-62.

1214. RATCLIFFE, D. (Bot.Dep.,Univ. Edinburgh). Biological flora of the

British Isles. No. 75. Draba muralis L. J.Ecol., 1960, 48,737-44, figs.4,tabs.2, bibl.6.
D. muralis is widespread as a garden weed in Gt Britain and Ireland. It is sporadically distributed throughout S. and W. Europe, but is nowhere abundant and is absent from much of Scandinavia and N.E. Europe. Observations are made on its distribution, habitat, communities, morphology, phenology and floral biology. - P.J.B. [468(42)]

1215. NEW, J.K. (Univ.Coll.W.Indies, Kingston 7,Jamaica). Biological flora of the British Isles. No.76. Spergula arvensis, L. (S. sativa Boenn., S.vulgaris Boenn.). J.Ecol., 1961, 49,205-15, figs.2,tabs.10, bibl.22.
Observations are made on distribution, habitat, communities, response to biotic factors, morphology, phenology, floral biology and pests and diseases. - P.J.B. [469(42)]

1216. NAVEH, Z. (Agric.Res.Sta.,Rehovot, Israel). Mediterranean grasslands in California and Israel. J.Range Mgmt, 1960, 13,(6),302-6, figs.6,tabs.2,bibl.19.
The ecological features, environment and vegetation of the Mediterranean area and California are compared. It is concluded that, unlike the situation in the Mediterranean, invasion by undesirable annuals, such as Elymus caput-medusae and Brachypodium distachyon, is still proceeding in California. - P.J.B. [O.W.]

1217. * PASE, C.P. An ecological study of sagebrush (Artemisia tridentata Nutt.) in western Montana. For.Thesis,Montana State Univ., 1958.

1218. BEETLE, A.A. A study of sagebrush. The section Tridentatae of Artemisia. Bull. Wyoming agric.Exp.Sta., 1960, 368,pp.83, figs.25,tabs.3,bibl.38.
A review is given of the origin and evolution of the N. American species of the section Tridentatae, together with seedling morphology, seed production and establishment, the extent of sagebrush range in the USA, control, taxonomy, and the distribution of different species and subspecies. J.L.M. [26(78.7)]

1219. ANDERSON, L.E., APPLEBY, A.P. and WESELOH, J.W. (Kansas Agric.Exp.Sta., Manhatton,U.S.A.). Characteristics of Johnsongrass rhizomes. Weeds, 1960, 8,(3), 402-6, figs.2,bibl.7.
Initiation of rhizomes in Sorghum halepense seedlings was found to occur ca. 4-5 weeks after emergence. Rhizomes were well developed after 6-7 weeks and continued to develop rapidly up to the winter dormancy stage. Rhizome sections buried in soil produced plants and new rhizomes, but were unable to propagate when buried for a second time after being detached at the mature-seed stage. Rhizome sections placed in moist vermiculite for 10 weeks produced most vegetative shoots when left intact, an intermediate number when segmented into portions each containing a node, and least when segmented after 5 weeks, but the differences were not significant. Rhizomes remained highly viable when dried to 40% of their initial weight. Vegetative shoots were produced sporadically when dried to 25% but none developed when dried further to the 20% level. - D.M.L.S. [O.W.]

1220. ROJAS-M, P. and ROJAS-GARCIDUENAS, M. (Inst.Teonologico de Monterrey,Mexico). Notes on the distribution of the Russian thistle (Salsola kali L. var. tenuifolia) in Mexico. Weeds, 1960, 8,(3),466-8, figs.1, bibl.9.
Includes a map showing the distribution of Russian thistle in Mexico. This species is apparently a recent immigrant from Texas. D.M.L.S. [O.W.]

1221. WILLIAMS, M.C. (Agric.Exp.Sta., Logan,Utah,U.S.A.). Biochemical analyses, germination and production of black and brown seed of Halogeton glomeratus. Weeds, 1960, 8,(3),452-61, figs.3,tabs.3,bibl.14.
Brown seeds are formed as a first photoperiodic response to the shortening days of midsummer. In the glasshouse, setting of black seeds could be prevented by supplementing the normal day length up to midnight with light of 60-400 foot-candles intensity. Plants artificially induced to produce only brown seeds formed additional flowers that gave rise to black seeds when placed in short days. The plants dried immediately after the production of black seeds. H. glomeratus seed germinated after August 15 and the plants grown continuously under normal daylight formed only black seeds. Seeds of intermediate type were observed. The role of the brown seeds is discussed. (See also Weed Abstr. 7:1491). From Author's summary. D.M.L.S. [O.W.

1222. BLACKBURN, R.D., LAWRENCE, J.M. and DAVIS, D.E. (U.S.Dep.Agric.,Fort Lauderdale,

Florida,U.S.A.). Effects of light intensity and quality on the growth of Elodea densa and Heteranthera dubia. Weeds, 1961, 9,(2), 251-7, tabs.4,bibl.9.
The growth reaction of E. densa and H. dubia to various light intensities and light sources under controlled laboratory conditions is described. H. dubia was shown to have a high light-requirement, and it is suggested that shading, i.e. by fertilization or by dyes, may be a possible control measure. E. densa has a low light requirement. Both species failed to survive the 12-week test period under the black lamp and most plants of both species died under the blue lamp. Both species grew very rapidly under the red lamp. Under the green lamp E. densa showed effects of solarization after 2 weeks whereas H. dubia grew almost 3 times as fast as under daylight lamps.
D.M.L.S. [O.W.]

1223. GOTTLIEB, J.E. (Pittsburgh Univ., Pennsylvania,U.S.A.). An experimental study of the shoot system of the bracken fern, Pteridium aquilinum. Amer.J.Bot., 1961, 48, (6/2),527.[Abstract] [O.W.]

1224. KUIJT, J. Morphological aspects of parasitism in the dwarf mistletoes (Arceuthobium spp.). Univ.Calif.Pub.Bot., 1960, 30,(5),337-436, figs.57,bibl.90.
A study which includes accounts of the behaviour and effects on individual hosts of the parasitism of the 8 species:
A. americanum, A. douglasii, A. pusillum, A. minutissimum, A. campylopodum, A. vaginatum, A. oxycedri and A. chinensi.
D.M.L.S. [O.F.]

1225. * BLAKELY, L.M. Some preliminary studies on the in vitro cultivation of Pseudotsuga menziesii callus and the dwarf mistletoe (Arceuthobium douglasii). For. Thesis,Montana State Univ., 1958.

1226. IVANOVA, S.D. [The influence of the host plant on the pharmacological properties of white mistletoe [Viscum album].] Sb.nauc.Rab.Mosk.farmacevt.In.-t, 1957, 1,243-8. Ref.2. (Biol.) 1958, 22,100, 500.

1227. WOODS, F.W. (Duke Univ.,Durham, N.Carolina,U.S.A.). Biological antagonisms due to phytotoxic root exudates. Bot.Rev. 1960, 26,(4),546-69, bibl.217.
A review. [53(75.6)]

1228. KINSINGER, F.E. and ECKERT, R.E. (Fort Hays Kansas Coll.,Hays,Kansas,U.S.A.). Emergence and growth of annual and perennial grasses and forbs in soils altered by halogeton leachate. J.Range Mgmt, 1961, 14,(4),194-7, figs.1,tabs.2, bibl.14.
Soils which supported whitesage, shadscale, and saltsage vegetation types were treated with halogeton [H. glomeratus] mulch under glasshouse conditions. Eight perennial grasses, 4 annual grasses and 4 forbs were sown in the treated soil and the emergence and height of the seedlings recorded after 2 weeks. The results indicated that soils altered by halogeton leachate are more favourable for halogeton and other low-value forb species than for desirable grasses. The saltsage soil appeared to be the most favourable of the 3 for germination and emergence of halogeton. From Authors' summary modified. - D.M.L.S. [O.W.]

1229. SEDDON, H.D. Chemical poisoning in animals. 3. Prussic acid. J.Agric., W.Aust., 1961, 2,(7),565-8, bibl.2.
A check list is given of some known cyanogenetic plants, including a number of weed species. Spraying with 2,4-D, 2,4,5-T and MCPA is stated to increase the hazard of HCl poisoning by such plants. Symptoms of HCl poisoning in livestock are described. - P.J.B. [O.W.]

AQUATIC AND WOODY WEEDS AND THEIR CONTROL

1230. GREEN, K.R. (Dep.Agriculture, Farrer Place,Sydney,Australia). Water hyacinth (Eichhornia crassipes). Agric. Gaz.,N.S.W., 1961, 72,(4),198.
An account of the occurrence and control (by high-volume sprays of 0.1-0.2% 2,4-D) of water hyacinth in New South Wales.
M.G.G. [O.W.]

1231. SEN, N.N. (Conservator of Forests, Rajasthan,India). A note on the eradication of water hyacinth in the Ghana bird sanctuary, Bharatpur, Rajasthan. Indian For., 1961, 87,(3),168-9.
Preliminary observation (1 month after treatment) showed no sign of revival in water hyacinth [Eichhornia crassipes]

treated with 6% Fernoxone (2,4-D sodium salt 80%) in water. A 4% concentration was ineffective. Costs are given. D.M.L.S. [O.F.]

1232. OWENS, M. and EDWARDS, R.W. (Water Pollution Res.Lab.,Stevenage, England). The effects of plants on river conditions. 2. Further crop studies and estimates of net productivity of macrophytes in a chalk stream. J.Ecol., 1961, 49,119-26, figs.4,tabs.4,bibl.4.
A study of the seasonal growth of weeds (Berula erecta, Callitriche spp., Ranunculus pseudofluitans and Elodea canadensis) in 3 reaches of the (chalk) River Ivel and of the effect of shading and sewage pollution on growth. Productivity data indicated that growth was primarily determined by the available amount of solar radiation. Enrichment of the water by sewage effluent discharge had no obvious effect. - D.M.L.S. [471(42)]

1233. HARDING, D. (Joint Fisheries Res. Org.,Samfya Lab.,N.Rhodesia). Limnological trends in Lake Kariba. Nature, 1961, 191, (4784),119-21, figs.2,tabs.2,bibl.5.
Observations are made on the effect of Salvinia auriculata on the oxygen content of the water of Lake Kariba. In a study at the Songwe estuary, the oxygen content of the water decreased from a saturation value of 71% in open water to approx. 37% 2 miles in from the edge of a stable mat of S. auriculata. The implications of reductions in oxygen tension caused by thermal stratification or by mats of S. auriculata for fish life are reviewed briefly. - P.J.B. [O.W.]

1234. * LINNIK, E.F. [Chemical methods of weed control in irrigation and drainage canals and reservoirs (a review of foreign literature).] Gidrotekh.i Melior., 1960, 2,56-9.

1235. FARMER AND STOCK-BREEDER. Clearing scrub at low cost. Fmr and Stk-Breed., 1961, 75,(3741),74, figs.1.
Low-cost scrub clearing in dense birch, which varied in height up to 25 ft and diameter up to 6 in., was demonstrated by The Holt Weed Breaker Co. in Yorkshire. The scrub is severely damaged by this treatment and although there is some regrowth, direct planting with, for example, Scots Pine, is possible. The machines cost approximately £500, but working cost/ac is reduced by two-thirds compared with hand-clearing the scrub. - J.W.F. [O.W.]

1236. * MIASOEDOV, S.S. [Releasing forest crops with the application of 2.4-D.] Lesn. Khoz., 1960, (4),16-18,(Russ.).

1237. POTTS, S.F. (Crawford,Mississippi, U.S.A.). Controlling woody plants with minimum damage to pines. Agric.Chem., 1961, 16,(7),49-51.
Practical procedures for the selective control of undesirable woody species in conifer plantations, using 2,4-D or 2,4,5-T applied by mist blowers, are reviewed. Aspects considered include application techniques for so-called high-, low- and combination-release work, droplet size and herbicidal mixtures. - P.J.B. [O.W.]

1238. MILLER, W.D. (For.Schl,State Coll., Raleigh,N.Carolina,U.S.A.). Development of planted loblolly pine in a poisoned upland hardwood stand of the lower Piedmont. J.For., 1961, 59,(3),184-6, tabs.6,bibl.5.
With winter applications, 2,4,5-T 2% in kerosene was as effective as Weedone (2,4-D 66% + 2,4,5-T 33%) 4% in kerosene and gave 80% kill of moderately dense hardwoods (mainly Cornus florida, Carya sp., and Quercus borealis) of 1-3 in. diameter. Basal spraying and stump spraying gave practically the same results. Loblolly pine seedlings, 1 year old, were planted in March following the treatments at a spacing of 5.5 x 5.5 ft. When compared after 9 growing seasons, the plots treated pre-planting with phenoxy herbicides showed much greater pine survival (875/ac as against 590/ac), about twice as many vigorous pines, a 20% greater average pine diameter and 2.69 times greater basal area than the control plots (where the following treatments had been carried out: cutting without spraying, cutting and spraying stumps with kerosene, and basal spray with kerosene). Treated plots had only one third as many hardwood stems of 1-3 in. d.b.h. as the check plots, but a much greater number of hardwoods up to 0.5 in. d.b.h. The pine was, however, clearly dominant. Volume production indices showed a 3:1 ratio in favour of the treated plots. The economics of the treatments are discussed. - D.M.L.S. [O.F.]

1239. DARROW, R.A. Aerial application of

herbicides for brush and weed control. Tex. Agric.Prog., 1960, 6,(2),19-23.
The chemical control of post oak [Quercus stellata] and blackjack oak [Q. marylandica], hardwoods in pine areas, sand shinnery oak [Q. havardi], sand sagebrush [Artemisia filifolia], whitebrush [Aloysia ligustrina], mesquite [Prosopis juliflora], Macartney rose [Rosa bracteata], Yucca spp., and some other brush spp. of South Texas is briefly reviewed. - D.M.L.S. [134(76.4)]

1240. DARROW, R.A. and McCULLY, W.G. Brush control and range improvement in the post oak-blackjack oak area of Texas. Bull.Tex.Agric.Exp.Sta., 1959, 942,pp.16, figs.17,tabs.7,bibl.15.
The distribution of post and blackjack oaks [Quercus stellata and Q. marylandica] in Texas is designated. Control by mechanical means (girdling, cutting, mowing, bulldozing, chaining and root-ploughing), goat grazing, burning and chemicals (2,4,5-T ester ± 2,4-D ester, 2,4,5-TP, 2,4-DP, monuron, fenuron, AMS) is reviewed and recommendations for these and other woody species are given. The effects of control measures on vegetation and soil conditions and the management of improved stands is also discussed. The following have proved ineffective or uneconomic under Texas conditions:- amitrole, 2,3,6-TBA, 2,4-D ester and amine, 2,4,5-T amine, 2,4-DB and MCPB. - D.M.L.S. [136(76.4)]

1241. GIBBS, C.B. (Nacogdoches Res.Centre, Texas,U.S.A.). Iso-octyl ester of 2,4,5-T in hardwood control. Weeds, 1960, 8,(3),462-3, bibl.7.
2,4,5-T (iso-octyl ester) injected into circumbasal wounds (1 per in. of estimated diameter) in Liquidamber styraciflua, Quercus stellata, Q. marylandica, and Q. falcata trees of 0.6-6.5 in. diameter gave complete kill of all species with 40% concentrations (in diesel oil), 82% kill of oaks and 50% kill of L. styraciflua with 20% concentrations, and 64% kill of oaks and 54% kill of L. styraciflua with 13.3% concentrations. D.M.L.S. [O.W.]

1242. LEAF, A.L. and SMITH, R.E. (Univ. Coll. of Forestry,Syracuse,New York,U.S.A.). Herbicidal value of arsenic trioxide in eastern United States. Weeds, 1960, 8,(3), 374-8, tabs.1,bibl.8.
Screening trials with 3 forms of arsenic trioxide (As_2O_3) - (a) crystalline 94.4%, (b) crude powder 92% and (c) crude powder 92% + calcium chloride ($CaCl_2$) 2% - showed that the minimum rate for uniform application was 1200 # for (a) and 700 # by hand or 1000 # by lawn seeder for (b) and (c). With (a), rates up to 2000 # showed herbicidal effects only on loamy sand (not on loam or silt loam) and after 3 years the effect was very slight. At 1500 # on a loam soil (b) showed no effect at 3 months, or 1 or 3 years after treatment. The addition of $CaCl_2$ to the crude powder makes it less subject to being blown about by the wind and less unjurious to personnel.
Results are given in detail of further trials with the (c) non-dusting form applied at 3 locations to various types of soil and vegetation. The toxic effect was greater on coarse than on fine-textured soils and on wet rather than well-drained soils. Grasses and herbaceous plants were more susceptible than woody plants. Bulldozing before treatment greatly increased the effect and when done, 1200 # kept 70-80% of the plot bare of vegetation for at least 3 years when applied to a sandy loam. - D.M.L.S. [O.W.]

1243. PEEVY, F.A. (For.Serv.,Alexandria, Louisiana,U.S.A.). Controlling southern weed trees with herbicides. J.For., 1960, 58,(9),708-10, figs.6,tabs.1.
General elementary information is given regarding the different methods of application, with mention of some uses for certain herbicides. - D.M.L.S. [O.F.]

1244. * CHAIKEN, L.E. Hardwood control. Forest Farmer, 1960, 19,(7),74-7.

1245. ELWELL, H.M. (Oklahoma State Univ., Stillwater,U.S.A.). Land improvement through brush control. Soil Conserv., 1960, 26,(3),56-59,(illus.).
A short review, in which results obtained with herbicides used for controlling a variety of woody species are given. M.G.G. [34(76.6)]

1246. * LEONARD, O.A. Control of woody plants by aircraft spraying. Agric. Aircraft Pilots' and Operators' Short Course, 1959, 168-71.

1247. CATINOT, R. and LEROY-DEVAL, J. (Centre Technique Forestier Tropical,Gabon). Essais de destruction de la foret dense par empoisonnement, au Gabon. [Trials for the destruction by poisoning of dense forest

in Gaboon.] Bois For.Trop., 1960, 69, 3-16,(F.),(illus.), figs.3,tabs.1.
The general results of spraying with 2,4,5-T ± 2,4-D in gas oil applied to the bark in slashes, on girdles, and in frilled girdles, are compared and the influence of season of treatment, size and age of tree, concentration of herbicide, carrier, and actual product, is discussed. The recommended method of application and the estimated mortality is given for 140 species. The addition of boric acid 0.05% to the hormone spray did not improve the results. - D.M.L.S. [O.F.]

1248. MOHAN LAL, K.B. (Conservator of Forests,Assam,India). Manipulation of undergrowth for aiding natural regeneration of evergreen and semi-evergreen forests. Indian For., 1960, 86,(7),414-16.
An account of selective weeding (by hand). D.M.L.S. [O.W.]

1249. WARD, W.H. The effect of vegetation on the settlement of structures. Proc.Conf.Biol.Civil Engng, 1949, 181-94, figs.5,bibl.14.
Discusses ground movements caused by moisture deficiency resulting from vegetation, the extent of movements associated with isolated trees, and the effect of shelter on adjacent vegetation and its action on the ground. Examples are given of damage caused by vegetation. - D.M.L.S. [472(42)]

1250. CRONEY, D. and LEWIS, W.A. The effect of vegetation on the settlement of roads. Proc.Conf.Biol.Civil Engng, 1949, 195-22, figs.11,tabs.1.
Includes a report on a survey of damage to roads by vegetation (especially fast-growing trees such as poplars [Populus spp.]) in southern England, and gives recommendations relating to the planting of trees and shrubs near roads. - D.M.L.S. [472(42)]

OTHER WEEDS AND THEIR CONTROL

1251. FRIESEN, G., FORBES, J.O. and HOWDEN, J.S. (Manitoba Univ.,Canada). Chemicals for wild oats control. Publ. Manitoba Dep.Agric., 1961, 320,(revised), pp.8.
Recommendations for propham, barban ± MCPA and di-allate. - D.M.L.S. [255(71)]

1252. WIESE, A.F. and REA, H.E. Field bindweed (Convolvulus arvensis) control with soil applications. Weeds, 1960, 8,(3),418-21.
Ester and amine formulations of 2,4,5-TP at 80 #, applied to the soil at various seasons over a 3-year period, gave an average control of 87 and 89%, respectively, of C. arvensis ca. 1 year after treatment and was more effective than any of the following at 80 # (given in decreasing order of effectiveness): 2,4,5-T ester and amine, 2,4,5-TES, 2,4,D ester, amine, acid, 2,4-DES, and amitrole. Anhydrous borax 2560 # averaged 83% control, but does not usually reach maximum effectiveness until 2 years have elapsed. 2,4-D 7.5% + disodium tetraborate pentahydrate and decahydrate to total 41% boron trioxide at 640 # averaged 69% control which was better than 2,4-D alone. Effectiveness appeared to be related to persistence in the soil. The residual effect of 2,4,5-TP and 2,4,5-T was much less reduced by soil moisture than was that of 2,4-D or amitrole. - D.M.L.S. [O.W.]

1253. HIGGINS, R.E. and ERICKSON, L.C. (Idaho Agric.Exp.Sta.,Moscow,U.S.A.). Canada thistle. Identification and control. Bull. Idaho agric.Ext.Serv., 1960, 338,pp.3.
A short review of Cirsium arvense, with brief reference to its control by 2,4-D, amitrole, soil sterilants, cultivation and the use of lucerne crops. - M.G.G. [18(79.6)]

1254. FREEMAN, J.F. (Kentucky Univ.,U.S.A.). Controlling giant foxtail. Leafl.Kentucky Univ., (?1961), 132-A,pp.4.
The following recommendations are given for controlling giant foxtail [Setaria spp.]: in uncultivated ground, dalapon 4.25 # or TCA (sodium) 15 # in 100 gal water before appearance of seed heads; in maize, simazine 80 W (80% wettable powder) or atrazine 80 W 13-20 oz/ac (of the wettable powder), or Randox T [CDAA + trichlorobenzylchloride] 1.5 quart/ac (not to be used on sandy soils); in soybeans, Napclor (sodium salt of PCP) 5-6 # (powder) or 4-4.75 quart/ac (liquid), Alanap 3 [NPA (sodium) 22%] 2.75 quart/ac, Randox [CDAA] 1.33 quart/ac (not on sandy soils), or amiben 1.33 quart/ac. - D.M.L.S. [19(76.9)]

1255. YOUNGNER, V.B. and GOODIN, J.R. (Univ.Calif.,Los Angeles,U.S.A.). Control of Pennisetum clandestinum, Kikuyu grass. Weeds, 1961, 9,(2),238-42, tabs.2,bibl.9.
P. clandestinum, which is distinguished from Stenotaphrum secundatum, though sometimes used in California for soil erosion control and as a turf grass, has become a serious

weed on irrigated lands especially in turf areas. Methyl bromide 1 lb/100 sq.ft applied under a plastic cover resulted in complete eradication and 2 lb/100 sq.ft destroyed both seeds and vegetative growth. SMDC 450 # killed all top growth, but not the seeds. Erbon 675 # and a mixture of sodium chlorate 40% and sodium metaborate 58% at 1300 # killed the weed; no seedlings appeared during the 3 months observed, and the residual effect lasted for at least a year. Dalapon 8 # applied 3 times at monthly intervals gave complete control and prevented seedling development. Satisfactory results were also given by dalapon + 2,4,5-TP mixture (50.8 + 7.7%) 45 # and by amitrole 16 #, followed by simazine 2 # or EPTC 6 #. A method developed for kikuyu grass control in lawns was to fumigate with SMDC prior to sowing dichondra which is tolerant to dalapon; any kikuyu seedlings are then sprayed with dalapon (2 oz per 5 gal water). The following were found to restrict flowering effectively when applied at weekly intervals: 1,2-dihydropyridazine-3,6-dione 500 p.p.m., naphthaleneacetic acid 200 p.p.m., tris 2,4-dichlorophenoxyethyl phosphite 10 000 p.p.m. and 2,4,5-T 250 p.p.m. - D.M.L.S. [O.W.]

1256. BESSA, J. Interesse e uso de herbicidas pelo Departamento Nacional de Obras de Sancamento, no Distrito de Santa Catarina. [Interest in and use of herbicides by the National Department of Sanitation Works, in the District of Santa Catarina.] An.Semin.Brasil.Herbicidas Ervas Daninhas 1958, 1959, 155-59.

Ammate X (AMS) as a foliage spray at 2 kg/80 l water was promising for the control of marica [Mimosa sensaria]. Paspalum sp., a useful species for stabilizing the banks of canals and irrigation channels, was resistant to monuron 480 g/100 m^2. - D.M.L.S. [O.W.]

1257. MOHAN LAL, K.B. (Conservator of Forests, Assam, India). Eradication of Lantana, Eupatorium and other pests. Indian For., 1960, 86,(8),482-4.

In the Khasi and Jaintia Hills, the Khasi people have brought Lantana camara and Eupatorium odoratum under control by using them to enrich the soil. The branches are cut, laid over cultivated areas, allowed to dry, covered with sods which are allowed to dry, and then slowly burned. After light hoeing, potatoes and other vegetables are planted and cow dung added at the same time. Other crops such as maize or sweet potato are planted after harvesting the potatoes, and the area is then left uncultivated for 5-10 years. - D.M.L.S. [O.F.]

1258. MONI, N.S. and SUBRAMONIAM, R. (Agric.Coll., Vellayani, Kerala, India). Essential oil from Eupatorium odoratum - a common weed in Kerala. Indian For., 1960, 86,(4),209, bibl.2.

Physiochemical properties of the oil were determined. The non-susceptibility of the plant to insect pests suggest that the oil may have insect-repellent properties. D.M.L.S. [O.F.]

1259. * CARTER, M.C. The phytocidal action of amitrol on honeysuckle. [Lonicera spp.]. For.Theses, Duke Univ., 1959.

1260. KIRKWOOD, R.C. and FLETCHER, W.W. (Bot.Dept., W.Scot.Agric.Coll., Auchincruive, Ayre). The chemical control of bracken. Res.Bull.W.Scot.Agric.Coll., 1961, 28, pp.29, tabs.20, bibl.24.

Trials in W. Scotland during 1957-8 with 4-CPA nonyl and butoxy esters, amitrole and dalapon are reviewed. In the 1959 trials maximum control with all chemicals was obtained by treatment when the fronds were fully expanded, but before the cuticle became thickened. The reasons for this are examined. Optimum spraying time varied with the locality. In Argyll in 1959, spraying in July on a south-facing slope, or in August on a north-facing slope gave 70-75% reduction in frond numbers, as assessed in August, 1960. Conversely, spraying a south-facing slope in August gave only 54% frond reduction and spraying the north-facing slope in July only 33% reduction. An estimate of costs is given for the reclamation of bracken-infested land using 4-CPA.

In an unfinished trial in 1960, 2,6-dichlorobenzonitrile(2,6-DBN) 3, 6 and 9 # was applied in May before frond emergence ± removal of litter; 9 # without removal of litter gave the best results (70% frond reduction in July 1960). A working hypothesis for the explanation of the activity of 2,6-DBN is given, based on its affinity for lipodal material (in this case growing bracken shoots) and its transformation to 2,6-dichlorobenzoic acid.

Post-spraying management, including re-spraying and grazing, and greenhouse trials on the effect of litter removal are also reviewed. Fertilization with basic slag and lime after treatment with 4-CPA, gave increased germination of sown herbage species and herbage yield. Nitrochalk reduced sward establishment. Herbage yields after spraying in September were lower than after spraying in July. - M.G.G. [36(411)]

1261. * ECKSTEIN, Z. and SZULCOWA, E. (Politechnika,Warsaw). [Herbicides. 15. Preparation of 2,4,5-tribromophenoxyacetic acid.] Roczniki Chem., 1959, 33,1477-83, (Pol.,e.).

1262. MELNIKOV, N.N. and KUKALENKO, S.S. Herbicides and plant-growth regulators. 33. Synthesis of some halophenoxyalkylcarboxylic acids and their derivatives. Zhur.Obshchei Khim., 1959, 29,3708-10. Chem. Abstr.54:19557.

1263. * WADA, H. and TAKEDA, A. [Synthesis of plant growth substances. 4. α-(3,4-Dichloroanilino) fatty acids.] Nogaku Kenkyu, 1959, 47,111-13.

1264. EHRMANTRAUT, J. and AGUIRRE, F. Separation and determination of 2,4- and 2,6-dichlorophenoxyacetic acids. Scientia, 1958, 25,(4),230-3.
The separation and quantitative determination of 2,4- and 2,6-dichlorophenoxyacetic acids by means of quantitative chromatography is proposed. From Chem.Abstr.54: 25517. - P.J.B.

1265. MILICEVIC, B.T., JANKOVIC, S.C. and VITOROVIC, O.D. Analysis of substituted acetic acids used as herbicides. 1. Spectrophotometric determination. 2. Polarographic determination. 3. Refractive index method. Glasnik Khem.Drushtva,Beograd, 1957, 22, 363-75.
Anal. Abstr.6:4194.

1266. * MILICEVIC, B.T., JANKOVIC, S.C. and KOSTIC, I.LJ. Analysis of substituted acetic acids used as herbicides. 4, 5. Glasnik Khem.Drushtva,Beograd, 1958/59, 23/24,(1/2),67-77.

1267. KREWSON, C.F. and SAGGESE, E.J. (E.Region Res.Lab.,U.S.Dep.Agric., Philadelphia 18,Pa,U.S.A.). Chemistry of some amino acid derivatives of 2,2-dichloropropionic and 2,3,6-trichlorobenzoic acids. Weeds, 1960, 8,(3),407-12, tabs.2,bibl.8.
The synthesis and properties of 18 amino acid derivatives of dalapon and 2,3,6-TBA (9 of each) is described. Only one of these N-(2,2-dichloropropionyl)-L-leucine, has so far been evaluated for herbicidal properties. D.M.L.S. [O.W.]

1268. * ECKSTEIN, Z., URBANSKI, T. and MIKULSKI, J. (Politechnika,Warsaw). Herbicides. 13. Preparation of 5-nitro-5-hydroxymethyl-3-(2-aryloxyethyl)tetrahydro-1,3-oxazines. Roczniki Chem., 1959, 33, 519-24,(Pol.,e.).

1269. PIZEY, J.S. and BATES, A. (Wye Coll., Ashford,Kent,England). The pre-emergent herbicidal activity of certain acetaldehyde and chloro-substituted aldehyde addition products and related compounds. J.Sci.Fd Agric., 1961, 12,(8),542-7, tabs.6,bibl.18.
In laboratory and glasshouse tests, using mono- and dicotyledonous plants, the pre-em. herbicidal activity of the following 3 series of Cl-substituted aliphatic aldehyde addition products was assessed: (a) nitro-alcohols and related compounds, (b) addition compounds of chloral with urea and substituted ureas and (c) addition compounds of chloral with amides. The chloral-nitro-paraffin and chloral-amide addition products showed selective herbicidal effect against monocotyledonous plants, but were almost inactive against dicotyledonous plants. The presence of a CCl_3 group appeared to be necessary for phytotoxic action and it was postulated that this action was due to breakdown to trichloroacetic acid. Compounds which were regarded as worthy of further test under field condition included chloral-acetamide, monochloralurea and 1,1,1-trichloro-3-nitrobutan-2-ol. Data are given of the persistence of 1,1,1-trichloro-3-nitropropan-2-ol in soil. P.J.B. [O.W.]

1270. CALDERBANK, A. (Plant Protection Ltd., Fernhurst Research Station,Haselmere,Surrey, England). Diquat: a new herbicide and desiccant. Agric.Vet.Chem., 1960, 1,(4), 197-200.
An account of the properties, uses, toxicity and residues, and the mode of action of diquat. - D.M.L.S. [O.W.]

1271. PHILLIPS, M.A. (Dr.M.A.Phillips and Associates,Romford,Essex,England). Total weed-killers. Pest Technol., 1961, 3,(10, 233-5, tabs.3.
A review of the properties and costs of non-selective herbicides, together with recommendations for future research. A list is given of compounds with possible phytotoxic properties or value as synergists, together with a tentative short list of types of compounds worthy of screening as herbicides. J.L.M. [O.W.

1272. NOSE, K. and FUKUNAGA, K. (Nat. Inst.Agric.Sci.,Tokyo). Method of expression of phytotoxicity. Noyaku Seisan Gijutsu, 1960, No.1,23-7.
The phytotoxicity of several chemicals was estimated by a modified Swanson's method, using germinating seed of Raphanus sativus var. acanthoformis. The following equation was derived: $dy/dC = Ky^nC^{\beta-1}$, where C = concentration of chemical, y = root length, k and β are constants and n = 1 for $HgCl_2$ and 2 for phenylmercuryacetate, 2,4-D, $CuSO_4$ and an emulsifier. No significant differences were found between the β values of chemicals with the same n value. It was concluded that a 50% growth-inhibition concentration was suitable as a means of expressing the phytotoxicity of chemicals. The following calculated values were obtained (p.p.m.): phenylmercuryacetate 2.11, 2,4-D 0.0384, $CuSO_4$ 19.8 and $HgCl_2$ 41. From Chem.Abstr. 54:25500. - P.J.B.

1273. * MAJUMDER, S.K. (Central Food Technol.Res.Inst.,Mysore,India). Pesticides and health hazards. Annu.Rev.Fd Technol., Mysore, 1959, 1,36-72, bibl.252.

1274. RADELEFF, R.D. and BUSHLAND, R.C. (U.S.Dept.Agric.,Kerrville,Texas,U.S.A.). Toxicity of pesticides for livestock. Proc.Symp. The nature and fate of chemicals applied to soils, plants and animals. Agric.Res.Serv.,U.S.Dep.Agric., 1960, ARS 20-9,134-60, tabs.4,bibl.122.
Includes a study of the oral toxicity to sheep and cattle of various formulations of the following: 2,4-D, 2,4,5-T, 2,4,5-TP, MCPA, dalapon, PCP, dinoseb and Delrad (dehydroabiethylamine acetate). A table of dosage tolerances is given. - M.G.G. [O.W.]

1275. LHOSTE, J. Les repercussions de l'emploi des desherbants chimiques sur la faune aquatique. [The effects of the use of chemical weed-killers on aquatic fauna.] Phytoma 1959, 105,13-17,(F.),(illus.), tabs.1.
A review of the toxicity to aquatic plants and to fish and other aquatic fauna of the following herbicides: copper sulphate, sodium arsenite, ammonium sulphamate, borax, potassium permanganate, mineral and aromatic oils, 2,4-D esters, MCPA, 2,4,5-T, amitrole, dalapon, TCA and dehydroabiethylamine acetate (Delrad). The doses tolerated by fish and the DL 50 for rats are tabulated. D.M.L.S. [L.EB.]

1276. RODENHISER, H.A. The nature and fate of chemicals applied to soils, plants and animals. Agron.J., 1960, 52,712-15.
Aspects discussed include that of the authorities responsible in the U.S.A. for conducting research on pesticide residues, and the present state of research on the subject. - P.J.B. [114(75.2)]

1277. WOODFORD, E.K. and SAGAR, G.R. (Editors). (A.R.C. Weed Res.Org.,Begbroke, Nr.Oxford). Herbicides and the soil. Blackwell Scientific Publications, pp.88, 17/6d.
A symposium consisting of 4 papers and the discussions that followed. The subjects of the papers, which have been abstracted were: (a) The microbiological breakdown of herbicides in the soil, by L.J. Audus (Weed Abstr. 10:156); (b) The effect of herbicides on soil micro-organisms, (a summary of more than 250 papers) by W.W. Fletcher (Weed Abstr. 10:159); (c) Problems resulting from the persistence of herbicides, by W. van der Zweep (Weed Abstr. 10:157) and (d) physico-chemical aspects of the availability of herbicides in the soil, by G.S. Hartley (Weed Abstr. 10:158). - D.M.L.S. [O.W.]

1278. SHEETS, T.J. and DANIELSON, L.L. (U.S.Dept.Agric.,Stoneville,Mississippi, U.S.A.). Herbicides in the soil. Proc. Symp. The nature and fate of chemicals applied to soils, plants and animals. Agric.Res.Serv.,U.S.Dept.Agric., 1960, ARS 20-9,170-81, bibl.62.
A short review of methods of assaying herbicidal residues and factors affecting their persistence and movement in the soil, including microbial action, volatilization, adsorption, leaching, chemical reaction, photodecomposition and absorption by plants. M.G.G. [O.W.]

1279. ASHTON, F.M. and DUNSTER, K. (Calif.Univ.,Davis,U.S.A.). The herbicidal effect of EPTC, CDEC, and CDAA on Echinochloa crusgalli with various depths of soil incorporation. Weeds, 1961, 9,(2), 312-17, figs.4,bibl.4.
The effectiveness of EPTC, CDEC and CDAA was markedly influenced by the depth of soil incorporation. The herbicides became less effective the deeper their incorporation (over the range 0-3 in.) owing to the dilution effect of the soil, which reduced the actual concentration of the herbicide

in the vicinity of germinating weed seeds. With EPTC the most effective depth was 1 in. when the weed seed was at a depth of 0.5 in. With CDEC and CDAA there was little difference in effectiveness at the higher rates (2 and 4 #) between incorporation depths of 0, 0.5 and 1 in.
It is suggested that the rate of application of soil-incorporated herbicides be expressed as pounds per acre-inch rather than as lb per ac. Partly Authors' summary modified. - D.M.L.S. [O.W.]

1280. OVERMAN, A.J. Effectiveness of various soil fumigants in commercial chrysanthemum production. Proc.Florida State Hort.Soc., 1958, 71,394-400, bibl.10.
Soil fumigation with methyl bromide (2 lb/100 sq.ft) and DMTT (300 #) consistently resulted in increases in plant production. Nemagon (1,2-dibromo-3-chloropropane) and ethylene dibromide were more effective when injected to a depth of 6 in. than when drenched on the soil surface. A drench of allyl alcohol, applied with Nemagon or ethylene dibromide, was an excellent combined herbicide-fungicide treatment. SMDC as a drench significantly reduced soil pests, but had only a mild effect when injected into a soil mixture containing German peat. From Hort. Abstr. 29:2734. J.W.F.

1281. HIRSCH, P. and ALEXANDER, M. (Institut fur Mikrobiologie, Universitat, Gottingen,Germany). Microbial decomposition of halogenated propionic and acetic acids. Canad.J.Microbiol., 1960, 6,241-9.
The compounds tested included dalapon, TCA and 2,4-D. Strains of Nocardia and Pseudomonas were found actively to degrade dalapon, 90-100% of the halogen being liberated within 3 weeks. Evidence for decomposition without chloride production was obtained. β-substituted propionates were more slowly attacked than α-substituted. D.M.L.S. [O.R.]

APPLICATION AND MACHINERY

1282. GOWING, D.P. (Pineapple Res.Inst. Hawaii). Comments on tests of herbicide mixtures. Weeds, 1960, 8,(3),379-91, figs.6,bibl.23.
Methods of calculating the possible interaction of herbicidal mixtures (e.g. by comparison of % response with concentration of herbicide, of response with log concentration and of the reciprocals of % response and concentration) are critically reviewed. D.M.L.S. [O.W.]

1283. HOOD, G.H., COSTEL, G.L., BECKER, C.F. and ALLEY, H.P. (Univ.Wyoming,Laramie,U.S.A.). Equipment for the application of herbicides to sugar beets. Mimeo.Circ.Wyoming agric. Exp.Sta., 1961, 138,pp.17, figs.14,tabs.3.
Results are given of calibration tests with 3 metering devices (variable orifice, 6 in.-wide rubber roller, and fixed orifice) and of tests comparing 6 methods for incorporating granular and liquid herbicides into the soil, i.e. (1) roto-tiller. (2) rotary hoe, (3) finger-weeder, (4) knife-weeder, (5) adapted sinner-weeder, and (6) no-incorporation (of granules) other than that provided by the furrow openers and drag chains. D.M.L.S. [27(78.7)]

1284. CARLETON, W.M., LILJEDAHL, L.A., IRONS, F., HEDDEN, O.K. and BRAZEE, R.D. (Agric.Engng Res.Div.,Agric.Res.Serv.,U.S. Dept.Agric.,Beltsville,Maryland,U.S.A.). The development of equipment in the application of agricultural chemicals. Proc.Symp. The nature and fate of chemicals applied to soils, plants and animals. Agric.Res.Serv., U.S.Dept.Agric., 1960, ARS 20-9,70-84, bibl.10.
In an introductory section, assumptions and requirements for optimum control of pests are reviewed. The main section reviews the current developments and state of knowledge of the following subjects: spray deposit measurement, the control and prediction of droplet size and the characteristics of spray applications made from the air, together with a consideration of fundamental problems of spray application, including spray droplet formation, trajectories and deposition of droplets. - P.J.B. [O.W.]

1285. * ASHTON, F.M. Aircraft for weed control in vegetable crops. Agric.Aircraft Pilots' and Operators' Short Course, 1959, 167.

1286. * FOY, C.L. Weed control in agronomic crops with particular reference to aerial application of herbicides. Agric.Aircraft Pilots' and Operators' Short Course, 1959, 160-7.

1287. PAGE, G.E. (Oregon Agric.Exp.Sta., Corvallis,U.S.A.). Influence of nozzle size

and type, hardness of water, and wetting agents on spray drift. Weeds, 1961, 9,(2), 258-63, figs.3, tabs.6, bibl.6.
Tests in a wind tunnel at low air speeds showed that with nozzle sizes 0.1, 0.2 and 0.3 gal/minute at 40 p.s.i. gauge pressure, spray drift decreased as nozzle size increased. Drift was greater for nozzles with 80° spray angle than for 65° spray angle at a discharge rate of 0.1 gal/minute. The interaction of nozzle type (flat fan or hollow cone) with spray angle in terms of spray drift amount, was highly significant, but the interaction between nozzle type and size was not significant. The degree of hardness of water had no significant effect on the amount of drift. Of 3 wetting agents tested at 0.01 and 0.1%, only Triton 114 (water soluble octyl phenoxy polyethoxy ethanol) at 0.1% increased spray drift significantly. - D.M.L.S. [O.W.]

1288. ORSENIGO, J.R. (Everglades Exp.Sta., Belle Glade, Florida, U.S.A.). Calibration suggestions for dry and liquid herbicides application. Mimeo.Rep.Everglades Exp.Sta. Fla, 1960, 61-2, pp.6, tabs.5.
Instructions are given for calibration procedures for dry chemical and spray application, also calibration tables for broadcast spraying with brush booms and for reduced dosages for small area spraying. D.M.L.S. [48(75.9)]

1289. BOWERS, W. and BUTLER, B.J. (Coll. Agric., Univ.Illinois, Urbana, U.S.A.). Use of low pressures for controlling drift of spray particles. Publ.Tractors and Machy, Univ. Illinois Coll.Agric., [n.d.], 18, pp.2, figs.2.
Gives data of average droplet size for different spray pressures and the distance travelled by spray drift at different droplet sizes, together with brief recommendations for reducing drift. - J.L.M. [32(77.3)]

1290. * KOROTKIKH, G.I. Use of the aerosol apparatus. Zashch.Rast.ot Vred.i Boleznei, 1960, (3), 13, (Russ.).

1291. AGRICULTURAL CHEMICALS. Respiratory devices for protection against inhalation of certain pesticides. Agric.Chem., 1961, 16, (7), 45-6.
Recommendations are given for the use of respiratory devices for the application of pesticides and data are given of the applicability of a range of commercial respirators and gas-mask canisters for protection against different pesticides (mostly insecticides). - P.J.B. [O.W.]

1292. BEST, K.F. and WENHARDT, A. (Exp. Fm, Swift Current, Sask., Canada). An experimental plot sprayer. Weeds, 1960, 8, (3), 464-5.
The sprayer, which is described and illustrated, is a modified form of the Derscheid machine. It has a rear castor, adjustable boom height and an additional pressure gauge. The compressed-air tank pressure gauge, the air pressure regulator gauge, and the spray control valve are mounted in front of the operator. The overall weight is approximately 140 lb. D.M.L.S. [O.W.]

1293. * FUNIKOV, A.V. Sprayer with rotating spray nozzles. Zashch.Rast.ot Vred.i Boleznei, 1960, (3), 13, (Russ.).

1294. * SARDARIAN, R.A. Lighter pressure sleeves for sprayers. Zashch.Rast.ot Vred. i Boleznei, 1960, (3), 13-14, (Russ.).

1295. LEEFE, J.S. (Res.Sta., Kentville, Nova Scotia.Canada). A variable dosage sprayer for treating small plots. Weeds, 1961, 9, (2), 325-8, figs.3, bibl.3.
The sprayer described (and illustrated) is patterned on the Leasure sprayer, but is mounted on a small 2 h.p. garden tractor, the engine of which propels the sprayer and drives a circulating pump to provide agitation in the concentrate tank. D.M.L.S. [O.W.]

1296. WEBSTER, D.H. and LEEFE, J.S. (Res.Sta., Kentville, Nova Scotia, Canada). A small plot sprayer using disposable spray containers. Weeds, 1961, 9, (2), 323-4, figs.1.
A small portable sprayer found to be most practical for experimental use in trials for the control of Kalmia angustifolia in lowbush blueberry plots is described in detail and illustrated. In order to reduce the amount of rinse water normally required to clean the sprayer between treatments, modifications were made to a standard knapsack sprayer so that the spray solution for each treatment could be held in an individual disposable polythene bag. D.M.L.S. [O.W.]

See also 1199

1297. MARRE, E. Sulla regolazione della crescita nelle piante superiori. [On the regulation of growth in higher plants.] Nuovo G.bot.ital., 1959, 66,641-93, bibl.74.
A review. [O.BO.]

1298. PERRIN, D.D. (Dep.Medical Chem., Inst.of Advanced Studies,Australian Nat. Univ.,Canberra). Improbability of the chelation hypothesis of auxin action. Nature, 1961, 191,(4785),253-5, figs.1, tabs.1,bibl.12.
In studies on complex formation by growth regulating substances (including 2,4-D, 4-CPA, 2,4-dimethylphenoxyacetic acid, NAA, IAA) and by chloroacetic acid and acetic acid, it was shown that plant-growth regulating acids of this type were only weak complexing agents. The stability constants of the copper complexes of IAA and acetic acid were almost identical and it appeared that only the carboxyl group played any part in complex formation. It was concluded that it was highly improbable that metal-complex formation played any part in the physiological activity of IAA or of any of the growth-regulating substances mentioned. - P.J.B. [O.W.]

1299. SHAW, W.C., HILTON, J.L. MORELAND, D.E. and JANSEN, L.L. (Crops Res.Div.,Agric.Res.Serv.,U.S.Dep.Agric., Beltsville,Maryland,U.S.A.). Herbicides in plants. Proc.Symp. The nature and fate of chemicals applied to soils, plants and animals. Agric.Res.Serv.,U.S.Dep.Agric., 1960, ARS 20-9,119-33, figs.5,bibl.69.
A review is given of the influence of the morphological characters of plants on the distribution, retention and uptake of herbicides, the translocation of herbicides in plants and mechanisms and sites of herbicidal action and metabolism, and of the present state of knowledge of the metabolism of different herbicides, including 2,4-D, simazine, atrazine, TCA, dalapon, monuron, propham, EPTC, amitrole, CDAA and MH in plants. - M.G.G. [O.W.]

1300. MITCHELL, J.W., LINDER, P.J. and SMALE, B.C. (Crops Res.Div.,Agric.Res. Serv.,U.S.Dep.Agric.,Beltsville,Maryland, U.S.A.). Growth regulators and therapeutants - their absorption, translocation, and metabolism in plants. Proc.Symp. The nature and fate of chemicals applied to soils, plants and animals, Agric.Res.Serv. U.S.Dep.Agric., 1960, ARS 20-9,181-8,bibl.64.
The fate of plant growth regulating chemicals in relation to the site of application and translocation within plants is reviewed briefly. - P.J.B. [O.W.]

1301. FAULKNER, J.K. and WOODCOCK, D. (Dep.Agric.and Hort.,Univ.Bristol Res.Sta., Long Ashton,Bristol,England). Metabolism of chlorophenoxyacetic acids by Aspergillus niger. Chem.and Industr., 1961, (34),1366-7. bibl.10.
Studies on the metabolism of 4- and 2-chlorophenoxyacetic acids by A. niger indicated that hydroxylation took place at all available sites in the ring. Products from the metabolism of 4-chlorophenoxyacetic acid were 4-chloro-2- and 4-chloro-3-hydroxyphenoxyacetic acid. The major metabolic products from 2-chlorophenoxyacetic acid were 2-chloro-4- and 2-chloro-5-hydroxyphenoxyacetic acids. Also formed in relatively smaller amounts were 2-chloro-3- and 2-chloro-6-hydroxyphenoxyacetic acids, and there was also evidence of the formation of O-hydroxyphenoxyacetic acid, which was considered to be the first example so far known of replacement of Cl by OH by a fungus. - P.J.B. [O.W.]

1302. DAVISON, J.G. (Dep.Agric.,Univ. Nottingham,Sutton Bonington,Loughborough, Leicestershire,England). The effect of growth substances on tomatoes. Rep.Schl Agric.Nottingham, 1960, 1961, 51-5, figs.4, tabs.1,bibl.2.
An investigation into the effect of MCPA, mecoprop, 2,4-D, 2,4,5-T, and 2,3,6-TBA + MCPA on tomato plants. Morphological changes and influence on yield are discussed. J.L.M. [O.W.]

1303. BEHRENS, R. and MORTON, H.L. (Texas Agric.Exp.Sta.,College Station,Texas, U.S.A.). Mesquite root inhibition tests to study inhibitory activity, absorption and translocation of 2,4-D and 2,4,5-T. Weeds, 1960, 8,(3),427-35, figs.4,tabs.3,bibl.20.
Where 2,4-D and 2,4,5-T at sub-lethal concentrations were added to solution cultures in which the roots of mesquite [Prosopis juliflora var. glandulosa] were grown, the inhibitory effect of 2,4-D was greater than that of 2,4,5-T; when applied to the cotyledons, however, 2,4,5-T caused most inhibition. Root growth inhibition was first apparent 4-6 hours after applications made to the cotyledons. Ethanol, diesel fuel and acetone-nontoxic oil carriers did not readily penetrate the cotyledons unless the epidermis was ruptured. When these 3 carriers were

compared, absorption of 2,4,5-T by cotyledons was greatest when acetone-nontoxic oil was used. The effectiveness of the carriers was correlated with the surface area wetted by the drop applied. Repeated applications of 2,4-D and 2,4,5-T to the cotyledons caused little or no impairment of basipetal translocation 48-72 hours after the initial application. From Authors' summary. - P.J.B. [O.W.]

1304. MORRE, D.J. and ROGERS, B.J. (Purdue University, Lafayette, Indiana, U.S.A.) The fate of long chain esters of 2,4-D in plants. Weeds, 1960, 8, (3), 436-47, figs.5, tabs.4, bibl.23.
Experiments are described (more fully than in the paper abstracted in Weed Abstr. 8: 1577) in which the enzymatic de-esterification and the in vivo hydrolysis of various 2,4-D esters prior to translocation were demonstrated. D.M.L.S. [O.W.]

1305. WEST, S.H., HANSON, J.B. and KEY, J.L. (Univ. Florida, Gainesville, U.S.A.). Effect of 2,4-dichlorophenoxyacetic acid on the nucleic acid and protein content of seedling tissue. Weeds, 1960, 8, (3), 333-40. figs.1, tabs.4, bibl.23.
2,4-D at herbicidal concentrations of 200-800 p.p.m. increased the ribonucleic acid (RNA) and protein content both of the stem tissue of intact cucumber plants and of sections of cucumber hypocotyl and maize mesocotyl, particularly in the case of the latter if basal sections were used. Such concentrations also produced marked increases in RNA in the microsomal fraction of the cytoplasm. Low concentrations of 2,4-D tended to promote the loss of RNA and protein which accompany endogenous growth. Authors' summary modified. - D.M.L.S. [O.W.]

1306. WILLIAMS, G. and DUNN, S. (Univ. Agric. Exp. Sta., Durham, New Hampshire, U.S.A.). Relation of light quality to effects of 2,4-D on chlorophyll and CO_2 exchange. Weeds, 1961, 9, (2), 243-50, figs.4, bibl.6.
With Brassica juncea as the test plant, CO_2 exchange measurements in light and darkness and chlorophyll analyses were made to determine whether the effect of 2,4-D in reducing the dry weight of plants was due chiefly to interference with CO_2 utilization (apparent photosynthesis) or promotion of CO_2 evolution (respiration). The main results were: (1) Blue light was most influential and red light least influential in promoting 2,4-D interference with CO_2 utilization in photosynthesis. (2) Red light had a considerable effect in causing low chlorophyll content in combination with 2,4-D, indicating that the effect of red light in reducing dry weight yield occurs largely through its activity in reducing chlorophyll content, which in turn would lower photosynthetic efficiency. (3) 2,4-D caused an increase in respiration under all light qualities tested. While the differences were not significant, the pattern of response was very similar to that for dry weight reduction by 2,4-D, i.e. red light and blue light in both cases produced the greatest differences between treated and control plants. Authors' summary modified. - D.M.L.S. [O.W.]

1307. * SUDI, J., JOSEPOVITS, GY., MATOLCSY, GY., HAMRAN, M. and VEGH, A. Herbicidal selectivity of some derivatives of 2,4-D due to differences in plant metabolism. Kiserlet.Kozlem., 1959, 52/A, (2), 73-92.

1308. WEST, S.H. and HANSON, J.B. (Univ. Florida, Gainesville, U.S.A.). The degradation of isolated microsomes from cucumber and corn seedlings. Weeds, 1960, 8, (3), 341-8, figs.1, tabs.7, bibl.19.
It is shown that isolated microsomal particles dissociate into sub-units upon incubation with potassium chloride or ethylenediaminetetraacetic acid and that 2,4-D has little effect on this process. These sub-units are further degraded into acid-soluble nucleotides by endogenous enzymes. A theory that potassium ion stimulates auxin-induced growth by accelerating the degradation of microsomal particles is discussed. Author's summary. [O.W.]

1309. SAWYER, R.L. (Cornell Univ., Riverhead, Long Island, New York, U.S.A.). Relation of chloro-IPC for potato sprout inhibition to internal sprouting of potatoes. Amer. Potato J., 1961, 38, (6), 203-7.
Reviews trials on the use of chlorpropham for sprout inhibition in stored potato tubers. - P.J.B. [O.W.]

1310. INGLE, M. and ROGERS, B.J. (United Fruit Co., La Lima, Honduras, C.A.). Some physiological effects of 2,2-dichloropropionic acid. Weeds, 1961, 9, (2), 264-72. figs.5, tabs.1, bibl.21.

Findings on the following are reported: (1) effect of dalapon on root elongation of maize and cucumbers; (2) influence of pH of ambient solution on dalapon effect, and relationship between uptake and pH; (3) effect of dalapon on oxygen uptake and basal respiration; (4) effect of dalapon on ^{32}P uptake and (4) influence of pantothenic acid, 1-pantoic acid and β-alanine on the growth inhibition of cucumber roots by dalapon. [Most of these findings have already been reported in Weed Abstr. 8:1583 and 9:1963.] It is suggested that dalapon does not interfere with respiration or the production of metabolic energy, but with its utilization. - D.M.L.S. [O.W.]

1311. HERRETT, R.A. and LINCK, A.J. (Union Carbide Chem.Co.Res.Sta.,Clayton, N.Carolina,U.S.A.). Penetration of 3-amino-1,2,4-triazole in Canada thistle and field bindweed. Weeds, 1961, 9,(2),224-30, tabs.3, bibl.12.

Canada thistle [Cirsium arvense] being resistant to amitrole and field bindweed [Convolvulus arvensis] susceptible, the present study was made in an attempt to clarify the nature of this difference in sensitivity. It was found that (1) penetration was primarily cuticular, (2) it occurred rapidly and at similar rates for both thistle and bindweed, (3) once the solution applied to the leaf had dried, penetration was much slower than when in solution, but was much more efficient in the case of the sensitive thistle than the resistant bindweed. It was suggested that differences in uptake account in part for the difference in sensitivity between the two species.

It was also noted that (1) environment had a pre-conditioning effect on the response of C. arvensis to amitrole, (2) the presence or absence of light either preceding or during the experiment had no influence on penetration, and (3) an effective concentration of amitrole reached the terminal apex of C. arvensis more rapidly under high than under low humidity. Partly from Authors' summary. - D.M.L.S. [O.W.]

1312. COUNTS, B. (Cotton Field Sta., Shafter,California,U.S.A.). Loss of geotropism and modification of root hair development produced by amitrole. Weeds, 1961, 9,(2),329-30, figs.1.

Radicles from cotton seeds treated for 2 hours with 200 p.p.m. amitrole showed loss of geotropism both when growing in petri dishes and in the soil. Germination of the seeds in petri dishes was not affected, but the root hairs were deformed and the seedlings died within 2 weeks of germination. Radicles from cotton seed soaked in 100 p.p.m. NPA for 2 hours also showed a similar loss of geotropism, but root hair development was normal. - D.M.L.S. [O.W.]

1313. HILTON, J.L. (U.S.Dep.Agric., Beltsville,Maryland,U.S.A.). Effect of histidine on the inhibitory action of 3-amino-1,2,4-triazole. Weeds, 1960, 8,(3), 392-6, figs.1,tabs.1,bibl.6.

L-histidine was shown to produce varying degrees of protection against the inhibitory effect of amitrole on the growth of Saccharomyces cerevisiae and Schizosaccharomyces pombe. This protective effect was not observed in experiments with one species of bacteria or 4 species of higher plants. However, it is suggested that the protective effect of histidine may be latent in these organisms, but masked by inhibition by amitrole of other equally sensitive growth processes, or by physical barriers blocking absorption, penetration or translocation of the metabolite. It is, therefore, postulated that histidine metabolism may be a process through which amitrole alters growth or the chemical quality of plants. - D.M.L.S. [O.W.]

1314. GENTNER, W.A. and HILTON, J.L. (U.S.Dep.Agric.,Beltsville,Maryland,U.S.A.). Effect of sucrose on the toxicity of several phenylurea herbicides to barley. Weeds, 1960, 8,(3),413-17, figs.2,bibl.8.

Sucrose administered to barley plants through cut leaf tips kept plants alive and growing in the presence of lethal concentrations of fenuron, monuron, diuron, neburon and 3-(3,4-dichlorophenyl)-1-methylurea. These results provide additional evidence that the toxic symptoms produced by these 5 herbicides are primarily a result of a herbicide-induced deficiency of photosynthate. A decreased effectiveness of sucrose against the higher applied rates of the herbicides suggests that metabolic reactions other than photosynthesis may be sensitive to these herbicides. Partly Authors' summary. - D.M.L.S. [O.W.]

1315. MONTGOMERY, M. and FREED, V.H. (Dep.Agric.Chem.,State Coll.,Oregon,U.S.A.). The uptake, translocation and metabolism of simazine and atrazine by corn plants. Weeds, 1961, 9,(2),231-7, tabs.5,bibl.4.

Maize plants were grown in soil treated with ^{14}C-labelled simazine or atrazine at 2 and 8 #. The total amount of ^{14}C in the plants

and the % still present in the form of the unaltered respective triazines was determined. The concentration of total ^{14}C in the plants decreased after about 30 days and the % which was chloroform-extractable steadily decreased from the first date of harvest. This was considered to suggest that these compounds are metabolized in the plant. The evidence for metabolism was confirmed by ion exchange and paper chromatography, by which it was shown that only trace amounts, if any, of these materials remained unchanged. From these results and in the light of the ability of the maize plant to degrade these triazines to $^{14}CO_2$, it was concluded that the maize plant is able readily to metabolise these compounds. Authors' summary. [O.W.]

1316. ROTH, W. (J.R.Geigy S.A.,Bale, Switzerland). 1. Mecanismes physilogiques de resistance a des substances phytotoxiques. Herbicides du groupe des triazines. [Physiological mechanisms of resistance to phytotoxic substances. Triazine group herbicides.] Bull.Soc.franc. Phys.veg., 1959, 5,150-1.
Evidence to date has shown 2 different defensive systems in plants against the toxic effect of triazine herbicides, both involving a modification of the toxic structure of the triazine. In 1 system, a phenolic substance, apparently a gamma-lactone, reacts directly with the herbicide as soon as it penetrates the roots, producing a slight transformation of the triazine, probably the simple formation of a complex lacking toxic action. In the other system, a polyphenol peroxidase system of oxidation has a more far-reaching effect: the toxic substance is finally metabolised by breaking the heterocyclic nucleus. This fact has been confirmed by results obtained with tracers; ^{14}C introduced by the triazine is found in the carbon dioxide given off by the plant. Maize possesses both of these systems. - D.M.L.S. [40(494)]

1317. SHEETS, T.J. (U.S.Dep.Agric., Stoneville,Mississippi,U.S.A.). Toxicity of simazine to seedling oat plants. Weeds, 1961, 9,(2),331-3, tabs.2,bibl.4.
Oat seedlings were exposed to simazine solutions (0.05 p.p.m.w. ^{14}C-labelled simazine in 400 ml culture solution) for 0, 36, 60 and 108 hours, and 9 days later were separated into tops and roots, dried, ground, counted, corrected for self-absorption, and converted to specific activities. The specific activities (counts per minute per mg dry tissue) varied directly with exposure time. For all exposures the specific activity of tops was greater than that of roots. The dry weight of 4 seedlings (one culture) was reduced about 27% by 1.3 mg of simazine in the tops. The dry weight increase (difference between dry weight at treatment and at harvest) of tops was reduced 50% by 7.2 mg of simazine per g of tissue (7.2 p.p.m.w.) at harvest. Weight of tops and roots were reduced by all exposures. However, only a small % of the simazine which was in the culture at the initiation of the experiment was in the plants at time of harvest, and although the amounts measured at harvest do not necessarily represent the amounts absorbed, the amount required in the plant tissue to reduce plant weight was less than 2% of the simazine available for absorption. D.M.L.S. [O.W.]

1318. ASHTON, F.M., ZWEIG, G. and MASON, G.W. (Univ.Calif.,Davis.U.S.A.). The effect of certain triazines on $C^{14}O_2$ fixation in red kidney beans. Weeds, 1960, 8,(3),448-51, figs.2,bibl.5.
In experiments with excised leaves of red kidney beans, exposure to simazine for 40 hours at a concentration of 0.25 p.p.m. reduced $^{14}CO_2$ fixation by about 30%; at concentrations of 1 p.p.m. or more, $^{14}CO_2$ fixation was almost completely blocked. After 1 hour's exposure to simazine, trietazine and 2-methoxy-4,6-bis(ethylamino)-s-triazine (simetone) at 1 p.p.m., there appeared to be an initial increase in $^{14}CO_2$ fixation; after 3 hours simazine inhibited $^{14}CO_2$ fixation, simetone was similar to the control, and trietazine still appeared to stimulate $^{14}CO_2$ fixation. For the 6-, 24- and 48-hour exposure times, all 3 compounds markedly inhibited $^{14}CO_2$ fixation. It is concluded that inhibition of CO_2 fixation in light is an important factor in the phytotoxic properties of these compounds. - D.M.L.S. [223(79.4)]

1319. BINGHAM, S.W. and PORTER, W.K. (State Univ.,Baton Rouge,Louisiana,U.S.A.). The influence of N-(3,4-dichlorophenyl) methacrylamide on early growth and development of cotton. Weeds, 1961, 9,(2),282-9, figs.6,bibl.4.
N-(3,4-dichlorophenyl)methacrylamide (DCMA) reduced the rate of enlargement of cotyledons, the elongation of internodes, and the expansion of true leaves. Maximum reduction of cotyledon weight was obtained when DCMA was applied at the onset of most

rapid growth. Anatomical examinations of cotyledons and leaves indicated that the rate and amount of cell enlargement was uniformly reduced by DCMA.

Since the nitrogen (N) content of treated cotyledons remained constant, while that of untreated cotyledons decreased, DCMA appeared to immobilize, to some extent, the N in the cotyledons. In both treated and untreated true leaves the N content increased as the weight of leaves increased.

When hypocotyl sections were treated with IAA 0.1, 1 and 10 p.p.m. the greatest stimulation (ca. 30%) of straight growth was obtained with 10 p.p.m. This maximum stimulation by IAA was halved when an equal concentration of DCMA was applied with the IAA. DCMA alone had very little effect on growth of hypocotyl sections. Both DCMA and IAA reduced elongation of intact roots. These results suggest that DCMA may have been acting as a weak auxin.

Inhibition by DCMA of growth of cotyledons increased with increasing periods of contact, maximum reduction being approached closely in 3 hours. Authors' summary modified. D.M.L.S. [O.W.]

1320. BINGHAM, S.W. and PORTER, W.K. (State Univ., Baton Rouge, Louisiana, U.S.A.). The activities of certain enzymes from cotton treated in cotyledon stage with N-(3,4-dichlorophenyl)methacrylamide. Weeds, 1961, 9,(2),290-8, figs.8, bibl.12.

N-(3,4-dichlorophenyl)methacrylamide (DCMA) appeared to have no immediate effect on total oxygen uptake of cotyledons. DCMA reduced growth without any substantial effect on total respiration of cotyledonary and true leaf tissue. The results employing substrates (ascorbate, catechol and cytochrome C + p-phenylenediamine) suggested that ascorbic acid oxidase was the predominant terminal oxidase. DCMA reduced ascorbic acid oxidase activity in cotyledon tissue to the same extent as the effect on growth. - D.M.L.S. [O.W.]

1321. * DESPOIS, R. Coumarins and phenolic acids in relation to inhibition and activation of germination. Proc.Int. Congr.Biochem., 1958, 4,(5),33-36.

1322. BINGHAM, S.W. and PORTER, W.K. (State Univ., Baton Rouge, Louisiana, U.S.A.). Glycolic acid oxidase, catalase and peroxidase of cotton tissue. Weeds, 1961, 9,(2),299-306, figs.7, bibl.13.

N-(3,4-dichlorophenyl)methacrylamide (DCMA) had no apparent effect on glycolic acid oxidase activity. Catalase and peroxidase activity remained constant following DCMA treatment, whereas untreated plants increased in levels of activity of these enzymes. Catalase activity, like that of ascorbic acid oxidase, was reduced by DCMA to the same extent as the effect on growth, whereas glycolic acid oxidase activity was about the same for untreated and treated cotyledon tissue when based on nitrogen. - Authors' summary modified. - D.M.L.S. [O.W.]

1323. REDISKE, J.H. and SHEA, K.R. (For. Res.Centre, Centralia, Washington, U.S.A.). The production and translocation of photosynthate in dwarf mistletoe and lodgepole pine. Amer.J.Bot., 1961, 48,(6/1),447-52. figs.4, bibl.9.

This study was reported in abstract form in Plant Physiol., Supp. 35 (iii). (See Weed Abstr. 10:1970). - D.M.L.S. [O.W.]

1324. TURRELL, F.M. (California Univ. Citrus Exp.Sta., Riverside, U.S.A.). Growth of the photosynthetic area of citrus. Bot. Gaz., 1961, 122,(4),284-98.

In the first part of this study, the relations between leaf number, size and distribution and different physical characteristics of 4 Citrus sinensis trees of different ages are examined and in the second part, leaf blade area and blade length relations in Citrus and other species are considered. Data and correlations are given for converting data in terms of one measured characteristic to another. From the results, it is possible to estimate the damage to leaves caused by pesticides, growth hormones and other adverse factors. - M.G.G. [O.W.]

1325. BARBER, D.A. (A.R.C. Radiobiological Lab., Letcombe Regis, Wantage, Berkshire, England). Gas exchange between Equisetum limosum and its environment. J.exp.Bot., 1961, 12,(5), 243-51, figs.2, tabs.2, bibl.10. [O.W.]

PATENTS

1326. HAMM, P.C. and SPEZIALE, A.J. (Monsanto Chemical Co.). Herbicides. U.S. Pat.2 863 752; 9.12.58.

Preparation of compounds of the formula

x - $XC_6H_4NRCOCH_2Y$, in which Y is a halogen atom, R is an alkyl, alkenyl, alkynyl, haloalkyl, haloalkenyl, haloalkynyl or oxaalkyl radical with 6 or less C atoms, X is H, halogen, NO_2 or an alkyl radical with 4 or less C atoms. These compounds destroy grasses in the presence of broad-leaved plants. Examples are N-(2-chloroallyl)-α-chloroacetanilide, N-ethyl-p-α-dichloroacetanilide and a number of other α-chloroacetanilides. From Chem. Abstr. 54:20059. P.J.B.

1327. FISCHER, A., STANGER, H. and STUMMEYER, H. (Badische Anilin- u.Soda Fabrik A/G.). Herbicides. Ger.Pat. 1 032 023; 12.6.58.
Herbicides contain as active components tertiary amines of the type RR'R''N, in which R is an alkyl or alkylene group with 8-18 atoms and R' and R'' are alkyl groups with 1-7C atoms in the chain. Preferably, R' and R'' are members of an N-containing ring system with 2-6 CH_2 groups, e.g. of a hexamethylenimine ring in which R has a chain length of C_{12}-C_{14}. Examples are dimethyldodecylamine, dodecylpyrrolidine and dodecylhexamethylenimine. From Chem. Abstr. 54:25543. - P.J.B.

1328. HEYDEN NEWPORT CHEMICAL CORP. Herbicidal mixtures. Brit.Pat.817 174; 29.7.59.
Maize and sugar cane can be protected against weeds by treatment of the soil with a mixture of isomeric trichlorobenzoic acids or mixtures thereof. A preferred mixture is 2,3,6-trichlorobenzoic acid 70% + 2,4,5-isomer 20% + other isomers 10%. The herbicidal activity of the mixture is compared with that of 2,4-D. From Chem. Abstr. 54: 25542. - P.J.B.

1329. GYSIN, H. and KNÜSLI, E. (J.R.Geigy A/G.). Plant growth inhibitors. Ger.Pat. 1 035 398; 31.7.58.
Substituted diazines and benzodiazines are claimed as effective plant-growth inhibitors. Most are effective against particular plant species. The following are named in examples: 2,6-bis(ethylamino)-4-chloropyrimidine, 2-chloro-3-ethylamino quinoxaline, 2,4,6-trichloropyrimidine, 2,6-bis(diethylamino)-4-chloropyrimidine, 4-diethylaminoquinazoline, 2-chloro-4-ethylaminoquinazoline, 2-chloro-4-ethylaminoquinazoline, 2-chloro-4-methylquinoline, 2,6-bis(diethylamino)-4-methylpyrimidine, 2,6-diethoxy-4-methylpyrimidine, 2-diethylamino-4-methyl-6-chloropyrimidine, 2-chloro-3-ethylaminoquinoxaline, 2,6-bis(ethylamino)-4-chloropyrimidine, 4-diethylaminoquinazoline, 2-chloro-4-diethylaminoquinazoline and 2-diethylamino-4-methyl-6-chloropyrimidine. Formulations are given. From Chem. Abstr. 54:25543. - P.J.B.

1330. MILLER, R.E. (Monsanto Chemical Co.). Herbicidal compositions from chlorophenoxyacetates of iodosobenzene. U.S.Pat. 2 949 353; 16.8.60.
Preparation is described. Bis(2,4-dichlorophenoxyacetate) is effective as a pre-em. herbicide against broad-leaved weeds. From Chem. Abstr. 54:25543. - P.J.B.

1331. SPEZIALE, A.J. (Monsanto Chemical Co.). N-(Heterocyclic-substituted)-α-chloroacetamides as herbicides. U.S.Pat. 2 929 720; 22.3.60.
Preparation and herbicidal properties of α-haloacetamides. From Chem. Abstr. 54: 18566. - P.J.B.

1332. HOOKER CHEMICAL CORPORATION Chlorobenzoic amides and herbicidal compositions containing them. Brit.Pat. 834 880; 8.2.56.
The herbicide comprises a carrier and an amide of 2,3,5,6-tetrachlorobenzoic acid, prepared by interaction of the acid chloride with aqueous NH_3. J.Sci.Fd Agric. 12,(6),283. -

1333. MONROE, R.F. and ANDERSON, A.W. (Dow Chemical Co.). 2-Hydroxy-3-chloroalkyl ethers of acetylenic alcohols. U.S.Pat.2 946 825; 26.7.60.
The preparation and properties of 1-chloro-3-(1-ethynylcyclohexyloxy)-2-propanol, 2-methyl-3-butyn-2-ol and 3,5-dimethyl-1-hexyn-3-ol. The products were herbicides and corrosion inhibitors. From Chem. Abstr. 54:24464. - P.J.B.

1334. OUCHI, H. (Mitsin Chemical Ind. Co.Ltd.). Halogenated phenyl hydroxyethyl ether. Jap.Pat.912; 18.2.60.
Preparation and properties of 4-chlorophenyl-, dichlorophenyl-, 2,4,6-trichlorophenyl-, 4-chloro-2-methyl hydroxyethyl ether and a mixture of 4,5,6 (and 3,4,6)-trichloro-2-methylphenyl hydroxyethyl ether. These are useful as weedkillers. From Chem. Abstr. 54:19596. - P.J.B.

1335. TODD, C.W. (E.I.du Pont de Nemours & Co.). Polyfluoro carboxylic acid herbicidal compositions. U.S.Pat.2 949 354; 16.8.60.
Certain polyfluoro carboxylic acids and related compounds (preparation described in U.S.Patents 2 559 628 and 2 559 629) are used in herbicidal compositions and mixtures. They are effective for controlling grasses. From Chem. Abstr. 54:25543. P.J.B.

1336. WASCO, J.L., WADE, L.L. and LANDRAM, J.F. Phosphoramidates. U.S. Pat.2 929 762; 22.3.60.
Alkyl-substituted haloaryl esters of alkyl phosphoramidates were useful as herbicides and fungicides. Their preparation is described. 2,4-Cl-(tert-Bu) $C_6H_3OP(O)(OMe)NHMe$ was effective as an aquatic herbicide. From Chem. Abstr. 54: 18439.- P.J.B.

1337. KUNDIGER, D.G., MORRIS, G.F. and DICK, C.R. (Dow Chemical Co.). 3,3-Dichloro-2-methylacroleins. U.S.Pat.2 942 031; 21.6.60.
The title compounds are useful as parasiticides for the control of insects, bacteria, nematodes and fungi and as herbicides for controlling germinating seeds and seedlings. The preparation is described. From Chem. Abstr. 54:24407. - P.J.B.

1338. WHEELER, D.D. and YOUNG, D.C. (Dow Chemical Co.). N,N'-Di-(3-phthalidyl) derivatives of aromatic amines. U.S.Pat. 2 937 187; 17.5.60.
The preparation of 3,3'-[methylenebis (2,6-dimethyl-p-phenylenimino)] diphthalide is described. It has herbicidal properties. From Chem. Abstr. 54:19599. - P.J.B.

1339. WHEELER, D.D. and YOUNG, D.C. (Dow Chemical Co.). Phthalides. U.S.Pat. 2 904 554; 15.9.59.
The preparation of 3-phthalimido-, 3-maleimido-, 3-naphthalimido-, 3-(N-acetylbenzamido)- and 3-diacetamidophthalide is described. These compounds have use as herbicides. From Chem. Abstr. 54:24907. P.J.B.

1340. HUDSON, R.L. (Dow Chemical Co.). Ethyl 3-(2,4-dichlorophenyl)glycidate. U.S.Pat.2 939 872; 7.6.60.
Preparation. Chem. Abstr. 54:19712.

1341. RICKERT, H.B. and GEIGER, W.M. (Dow Chemical Co.). 2,4,6,8-tetra-tert-butylphenoxazine. U.S.Pat.2 945 856; 19.7.60.
The title compound was a herbicide. From Chem. Abstr. 54:24819. - P.J.B.

1342. GYSIN, H. and KNUSLI, E. (J.R.Geigy Akt.-Ges.). Triazine weed killers. Swiss Pat.329 277; 14.6.58.
The synthesis for 10 2-chloro-4,6-dialkylamino-s-triazine compounds are described and the phytotoxic action of several previously reported compounds is given. - Chem. Abstr. 54:20061h.

1343. FISCHER, A., PFAFF, C., STEINBRUNN, G. and STUMMEYER, H. (Badische Anilin-u.Soda Fabrik). Substituted urea herbicides. Ger. Pat.1 017 406; 10.10.57.
The title ureas are suitable as herbicides. Results are reported of the effectiveness of the following: N-hydroxyethyl (butyl or propyl)-N-(p-chlorophenyl)-N',N'-dimethylurea and N-(2,3-dihydroxypropyl)-N-(3,4-dichlorophenyl)-N',N'-dimethylurea. From Chem. Abstr. 54:18436. - P.J.B.

1344. LUCKENBAUGH, R.W. (E.I.du Pont de Nemours & Co.). 1-(2-Hydroxyethyl)-1-methyl-3-phenylurea. U.S.Pat.2 935 393; 3.5.60.
Preparation and properties.

1345. BRUGMANN, W.H., YOWELL, H.L. and MIKESKA, L.A. (Esso Research and Engng.Co.). Defoliation of plants with oxidized white oil emulsions. U.S.Pat.2 945 753; 19.1.60.
Preparation.

1346. NOLAN, J.H. Defoliation of crop-bearing plants with elemental iodine. U.S. Pat.2 937 081; 17.5.60.
Iodine at 0.1-20 # results in 90-100% defoliation of bean and cotton plants. A typical formulation consists of 1 part iodine, 1 part emulsifier, 100 parts acetone and 89 parts water. At 1 # this gave 95% defoliation of beans and at 2 #, 100% defoliation. From Chem. Abstr. 54:18864. - P.J.B.

1347. FARBWERKE HOECHST A.-G. Control of plant pests. Brit.Pat.835 546; 10.1.56.
The compounds include an aqueous emulsion containing 0.5% tributyl-(2,4,6-trichlorophenoxy)stannane, said to be 100% effective against algae. From Abstr. J.Sci.Fd.Agric. 12,(6),i-283. - D.M.L.S.

1348. * ARAI, M. Josozai no shiyo-ho. [How to use herbicides.] Tokyo, Asakura Shoten, 1959, pp.184.

1349. LEE, O.C. and WARREN, G.F. (Purdue Univ.Agric.Ext.Ser., Lafayette, Indiana, U.S.A.). Weeding with chemicals. 1961 recommendations. Mimeo. Purdue Univ.Agric.Ext.Ser.(1961), ID-1 (BP-HO), pp.17.
The following new (since 1960) recommendations are included: (1) for crabgrass [Digitaria sanguinalis] in bluegrass lawns, Dacthal [dimethyl-2,3,5,6-tetrachloroterephthalate] 0.25 lb/1000 sq.ft before emergence of crabgrass; (2) for small trees, brush etc., Dybar [fenuron] 60 #; and (3) for total weed control, simazine 15-20 #. - D.M.L.S. [51(77.2)]

1350. * PRUGININ, J. Keeping embankments clean of seasonal weeds. Bamidgeh, 1959, 11, (4), 69-70, 89-91, (Hebrew, e.).

1351. PHYTOMA. Une circulaire du Ministre de l'Agriculture sur l'utilisation des hormones herbicides. [A circular letter from the Minister of Agriculture on the use of hormone herbicides.] Phytoma, 1961, 13, (127), 50, (F.).
The text is given of a letter addressed by the Minister of Agriculture of France to Crop Protection Inspectors and Directors of Agricultural Services. It says that since important losses have been caused in different regions by the use of hormone weedkillers in proximity to vineyards, orchards and other sensitive crops and since such losses are not covered by the laws of 1943 and 1945, the greatest possible publicity should be given to the following precautions necessary when using hormone herbicides: (a) to use a sprayer with a volume rate of >200 l/ha and to use low pressure with booms as low as possible; (b) only to spray on windless days at a temperature not higher than 25°C; (c) to clean sprayers carefully after use. - D.M.L.S. [O.W.]

1352. CLARE, K.E. (Road Res.Lab., Harmondsworth, Middlesex). The use and control of vegetation on roads and airfields overseas. Road Res.Lab.Tech.Paper, 1961, 52, pp.42, figs.3, tabs.9, bibl.67.
A review is given of the detrimental effects of uncontrolled vegetation on roads and airfield pavements in parts of Africa and the West Indies and also a table of genera and species encountered on roadsides in tropical and sub-tropical regions, listed according to region and territory, with data of the rainfall and location of the area. Control methods, including the uses of herbicides and arboricides, are described. An estimate is made of the costs involved. - M.G.G. [470(42)]

1353. * de BRUYCHERE, R.C.C. De chemische bestrijding van planteziekten en onkruid in Zeeuwsch-Vlaanderen. [The chemical control of plant diseases and weeds in Zeeuwsch-Vlaanderen (Netherlands).] Landbouwvoorlichting, 1959, 16, (12), 695-702.

1354. * HADFIELD, J.W. Handbook of New Zealand agriculture: pastures and pasture species, arable farm crops, soils and manures, plant pests and diseases, weed control. Christchurch, Whitcombe and Tombs. 1959, pp.177.

1355. ENNIS, W.B. (Crops Protect.Res. Br., Crops Res.Div., Agric.Res.Serv., U.S. Dep.Agric., Beltsville, Md, U.S.A.). Use of herbicides, growth regulators, nematocides and fungicides. Proc.Symp. The nature and fate of chemicals applied to soils, plants and animals, Agric.Res.Serv., U.S.Dep.Agric., 1960, ARS 20-9, 17-27, figs.1, tabs.3, bibl.8.
Includes statistical data of the estimated acreage of different crops treated with pre- and post-em. herbicides in 1959. P.J.B. [O.W.]

1356. LAMBDEN, A.E. and SHARP, D.H. (Fisons Pest Control Ltd., Harston, Cambridge, England). Treatment of effluent from the manufacture of weedkillers and pesticides. Mfg Chemist, 1960, 31, 198-201.
Describes the use of activated carbon to reduce the concentration of bactericidal or bacteriostatic organic compounds to levels at which they can be directly discharged or destroyed in biolgical systems. From Chem. Abstr. 54:18839. - P.J.B.

1357. CANADA, DEPARTMENT OF AGRICULTURE. Herbicidal products currently registered as of June 2nd, 1961. Publ. Pesticides Unit, Plant Products Divn, Canada Dep.Agric., 1961, pp.57.
This list was prepared in response to a demand for information on registered herbicides in Canada and contains particulars of the brand name, registered number, registrant and guaranteed content of active ingredient of products registered for sale in Canada up to 2 June, 1961. - P.J.B. [O.W.

List of Common Names and Chemical Abbreviations

The following list based on that adopted by the Weed Society of America, has been approved by the British Weed Control Council, except for those marked □.

An asterisk (*) signifies common names approved by the B.S.I.

A plus sign (+) signifies approval by the Weed Society of America.

amiben □+	3-amino-2,5-dichlorobenzoic acid
amitrole □+	3-amino-1,2,4-triazole
AMS □+	ammonium sulphamate
atrazine □+	2-chloro-4-isopropylamino-6-ethylamino-1,3,5-triazine
barban □	4-chloro-2-butynyl-N-(3-chlorophenyl)carbamate
CDAA +	2-chloro-NN-diallylacetamide
CDEA +	2-chloro-NN-diethylacetamide
CDEC +	2-chloroallyl-NN-diethyldithiocarbamate
chlorpropham *	isopropyl-N-(3-chlorophenyl)carbamate
4-CPA +	4-chlorophenoxyacetic acid
4-CPB	4-(4-chlorophenoxy)butyric acid
2,4-D +*	2,4-dichlorophenoxyacetic acid
3,4-DA +	3,4-dichlorophenoxyacetic acid
dalapon +*	2,2-dichloropropionic acid
2,4-DB *	4-(2,4-dichlorophenoxy)butyric acid
DCU □+	dichloralurea
2,4-DEB +	2,4-dichlorophenoxyethyl benzoate
2,4-DES *	2,4-dichlorophenoxyethyl hydrogen sulphate
di-allate	2,3-dichloroallyl diisopropylthiolcarbamate
dichlone +*	2,3-dichloro-1,4-naphthoquinone
dinosam *	2-s-amyl-4,6-dinitrophenol
dinoseb *	2-s-butyl-4,6-dinitrophenol
diquat +*	$[1,1'$-ethylene-$2,2'$-bipyridylium$]^{2+}$
diuron +*	N-(3,4-dichlorophenyl)-N'N'-dimethylurea
DMTT □+	3,5-dimethyltetrahydro-1,3,5,2H-thiadiazine-2-thione
DNOC *	2-methyl-4,6-dinitrophenol or 3,5-dinitro-o-cresol
2,4-DP	2-(2,4-dichlorophenoxy)propionic acid
endothal +	3,6-endoxohexahydrophthalic acid
EPTC □+	ethyl-NN-dipropylthiolcarbamate
erbon +	2-(2,4,5-trichlorophenoxy)ethyl-2'2'-dichloropropionate
fenac □+	2,3,6-trichlorophenylacetic acid
fenuron +*	N-phenyl-N'N'-dimethylurea
ipazine □+	2-chloro-4-diethylamino-6-isopropylamino-1,3,5-triazine
MCPA +*	4-chloro-2-methylphenoxyacetic acid
MCPB *	4-(4-chloro-2-methylphenoxy)butyric acid
MCPES +	sodium 4-chloro-2-methylphenoxyethyl sulphate
mecoprop *	dl 2-(4-chloro-2-methylphenoxy)propionic acid
MH □+	maleic hydrazide
monuron +*	N-(4-chlorophenyl)-N'N'-dimethylurea
neburon +	N-(3,4-dichlorophenyl)-N'-butyl-N'-methylurea
NPA +	N-1-naphthylphthalamic acid
paraquat	$[1,1'$-dimethyl-$4,4'$-bipyridylium$]^{2+}$
PCP +	pentachlorophenol
PMA +	phenylmercuric acetate
propazine □+	2-chloro-4,6-bis(isopropylamino)-1,3,5-triazine
propham *	isopropyl-N-phenylcarbamate
simazine +*	2-chloro-4,6-bis(ethylamino)-1,3,5-triazine
SMDC □+	sodium methyl dithiocarbamate
2,4,5-T +*	2,4,5-trichlorophenoxyacetic acid
2,4,5-TB	4-(2,4,5-trichlorophenoxy)butyric acid
2,3,6-TBA +	2,3,6-trichlorobenzoic acid
TCA +	trichloroacetic acid
2,4,5-TES +	sodium 2,4,5-trichlorophenoxyethyl sulphate
2,4,5-TP	2-(2,4,5-trichlorophenoxy)propionic acid
trietazine □+	2-chloro 4-diethylamino-6-ethylamino-1,3,5-triazine
3Y9 □	tris-(2,4-dichlorophenoxyethyl)phosphite

CONTENTS

Volume 10, No. 7. July, 1961.

Arable and herbage crops 1178

Horticultural, ornamental and plantation crops 1200

Biology of weeds and poisoning by weeds 1211

Aquatic and woody weeds and their control 1230

Other weeds and their control 1251

Chemistry, physics, toxicology, residues and soils 1261

Application and machinery 1282

Physiology, morphology and anatomy 1297

Patents 1326

Miscellaneous 1348

Prepared monthly by the Information Section, Agricultural Research Council Weed Research Organization, Department of Agriculture, Parks Road, Oxford, England, and distributed by the British Weed Control Council, c/o, National Association of Corn and Agricultural Merchants, Cereal House, 58, Mark Lane, London, E.C.3, on subscription at £2 - 2 - 0 per year.